CDL1100

SERVICE MANUAL

For Technical Service

TABLE OF CONTENTS

6. CDM-47

6-1. GENERAL 6-1
6-2. Tools and Measuring Instruments 6-3
6-2-1. General and Special Tools List 6-3
6-2-1-1. General Tools 6-3
6-2-1-2. Special Tools 6-3
6-2-1-3. Test Disc 6-3
6-2-1-4. Measuring Equipments 6-3
6-2-1-5. Software 6-3
6-2-1-6. Expendable and Chemical Supplies 6-3
6-2-2. Setting Single-Operation of CDM-47 Mechanism Block 6-4
6-2-3. System Configration 6-6
6-2-3-1. Set up PS/VP System 6-6
6-2-3-2. System Configuration 6-6
6-3. Trouble Shooting 6-8
6-3-1. Before Trouble Shooting 6-8
6-3-2. Flowchart for Trouble Shooting 6-8
6-3-3. Procedure of ATP Test 6-9
6-3-3-1. Pre-setting 6-9
6-3-3-2. Test Procedure 6-10
6-3-4. Drive Function Check 6-12
6-3-4-1. Pre-Setting for Test Mode Operation 6-12
6-3-4-2. Flowchart 6-13
6-3-4-3. Test Command List 6-16
6-3-4-4. Spindle Motor 6-16
6-3-4-5. Sled Gear Train 6-16
6-3-4-6. 2-Axis Actuator 6-16
6-3-4-7. Focusing (Focus Bias) 6-16
6-3-4-8. Laser Power 6-16
6-3-4-9. Chucking Mechanism 6-17
6-3-4-10. Sled Motor 6-17
6-3-4-11. Spindle Motor Drive 6-17
6-3-4-12. E-F Balance 6-18
6-3-4-13. RF Level 6-18
6-3-5. Down Load Program 6-20

7. DIAGRAMS

7-1. Circuit Boards Location 7-1
7-2. IC Pin Function 7-2
7-3. Block Diagrams 7-21
7-4. Frame Schematic Diagram 7-29
7-5. Printed Wiring Board/Schematic Diagram 7-33
Main Section 7-33
Power Supply Section 7-40
Carrier, Mail Box Section 7-46
Panel Section 7-52
CD-ROM Drive Section 7-55
7-6. IC Block Diagrams 7-67
7-6-1. Main Section 7-67
7-6-2. Power Supply Section 7-69
7-6-3. CD-ROM Drive Section 7-70

8. EXPLODED VIEWS

8-1. Case Section 8-1
8-2. Front Panel Assy Section 8-2
8-3. Chassis Section 8-3
8-4. Back Panel Section 8-4
8-5. Carrier Assy Section 1 8-5
8-6. Carrier Assy Section 2 8-6
8-7. Carrier Assy Section 3 8-7
8-8. Disc Case Assy Section 8-8
8-9. Mail Box Assy Section 8-9
8-10. CDM-47 Section 8-10
8-11. BU Holder Section 8-11

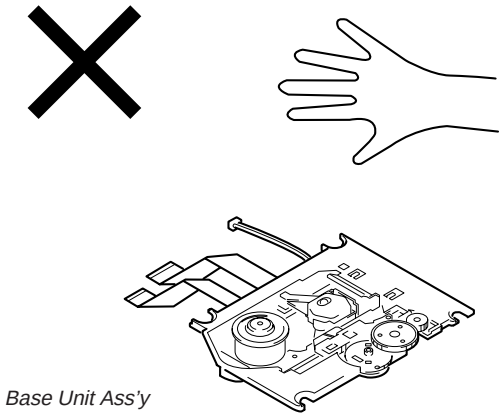
9. ELECTRICAL PARTS LIST

SECTION 6
CDM-47

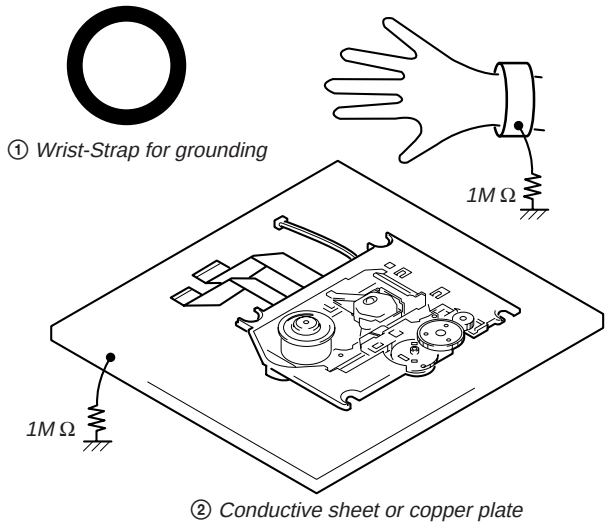
6-1. GENERAL

Note: Note on repairing the Base Unit Ass'y.
When operating or repairing the unit, grounding is required to prevent damage caused by static electricity and is as follows:

1. Grounding for the human body
   Besure to wear a wrist-strap for grounding (with impedance lower than $10^8\Omega$) whose other end is ground. The strap works to drain away the static electricity build-up on the human body.
2. Grounding for the work table
   Be sure to lay a conductive sheet (with impedance lower than $10^8\Omega$) on the table, sure as a sheet of copper, which is ground.
3. As static electricity build-up on clothes does not drain away, be careful not to let your clothes touch the unit.



Base Unit Ass'y



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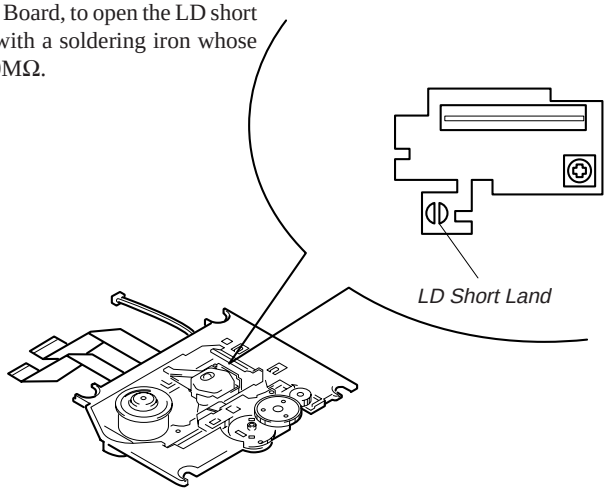
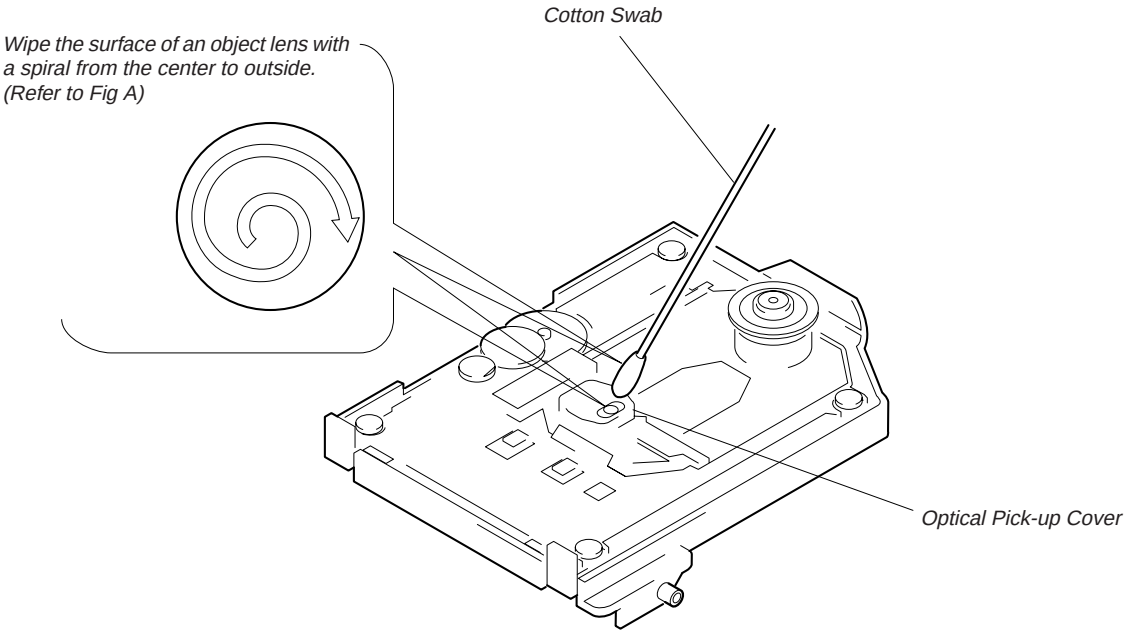
4. After connection to the MA Mounted Board, to open the LD short land, remove the soldering quickly with a soldering iron whose insulation resistance is larger than 10MΩ.



5. Do not apply excessive force to the when wiping. Optical device is structured by very sensitive mechanism parts.The lens holding mechanism may have damage if apply excessive force.


Cotton Swab
Wipe the surface of an object lens with a spiral from the center to outside. (Refer to Fig A)
Optical Pick-up Cover

6-2. TOOLS AND MEASURING INSTRUMENTS

6-2-1. GENERAL AND SPECIAL TOOLS LIST

The tools and measuring instruments for performing maintenance on the CDM-47 series are listed below.

6-2-1-1. General Tools

	SONY Parts No.
⊕Driver 2mm	(7-700-749-01)
⊕Driver 2.6mm	(7-700-749-03)
Tweezers	(7-700-753-02)
Round Nose Plier	(7-700-757-01)
Cutter	(7-700-758-02)
Soldering Iron (20W)	
Desoldering Metal Braid (Solder Wick)	
Multi Meter (DRM)	

6-2-1-2. Special Tools

IBM PS/VP System
- PS/VP and the monitor (640kbyte RAM, 3.5" FDD, HDD, Video RAM-CGA or Higher, DOS Ver. 6.2 or later)
- Adaptec SCSI board AHA-1520B or AHA-2940
- DC Power Supply (1-413-362-12)
- (If no power supply unit is available:Supply power from the CDL1100 unit.)
- Power cord (1-559-370-11)

SCSI 50P Flat Cable	(J-902-900-0A)
AU-CN Board	(A-8080-815-A)
BLER Counter For TC940X	(J-907-564-0A)
CDL1100 (CDM-47) CONTROLLER	(J-2501-141-A)
Active Speaker	

6-2-1-3. Test Disc

SONY Test Disc (YEDS-18)	(3-702-101-01)
SONY Test Disc (TGRS-21)	
SONY Test Disc (YEHS-4)	(3-702-548-01)

6-2-1-4. Measuring Equipments

Osilloscope Dual Trace 20MHz (probe x10)
DC Volt Meter (min. 10mA)

6-2-1-5. Software

ATP415 System Disc (OR-D019)	(8-980-308-19)

6-2-1-6. Expendable and Chemical Supplies

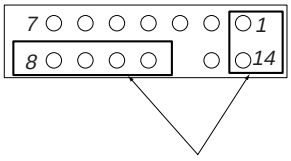
Cotton Swab (200 pieces)	(7-740-900-65)
Lens Cleaning Liquid	(J-250-100-0A)
Molykote Grease (EM-30L)	(4-918-645-01)
Hanarl (SFL-9)	(7-400-000-00)

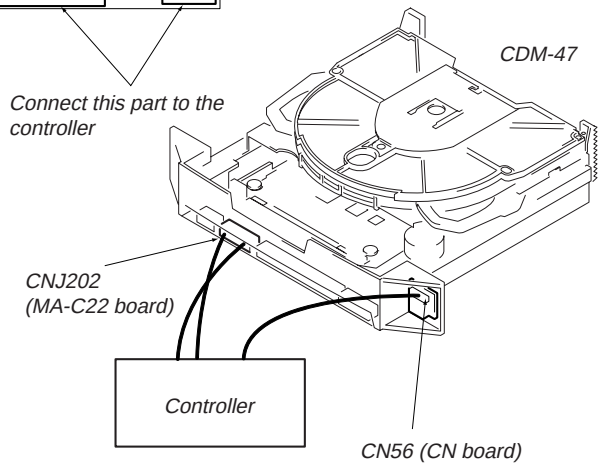
6-2-2. Setting Single-Operation of CDM-47 Mechanism Block

Jig :
CDL-1100 (CDM-47) controller : J-2501-141-A
Power supply unit : 1-413-362-12 (If no power supply units available : Supply power from the CDL1100 unit)
CD test disc (YEDS-18) : 3-702-101-01

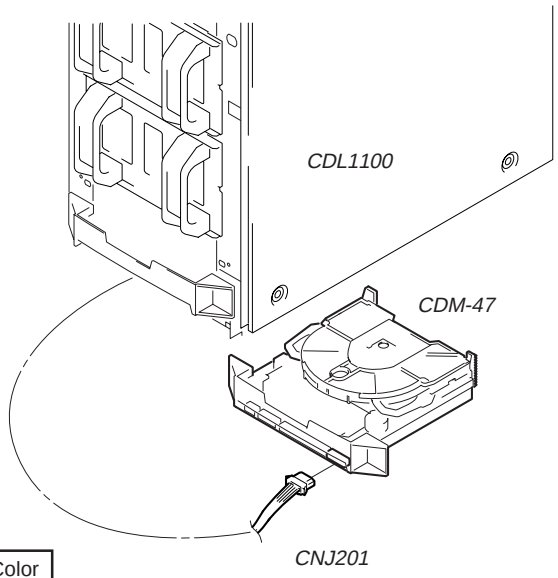
Connection Method :
If no power supply unit is available : Supply power from the CDL1100 unit.
Connect the unit (CNJ202, CN56:MA-22 board) and controller.

CNJ202 enlargement





Supplying power from the CDL1100 unit



Pin No.	Signal Name	Jig Wire Color	Pin No.	Signal Name	Jig Wire Color
1	Ground	White	8	Parity	Brown
2	Ground	—	9	ID0	Black
3	Ground	—	10	ID1	Yellow
4	Ground	—	11	ID2	Blue
5	Ground	—	12	NC	—
6	Ground	—	13	P/A	—
7	Ground	—	14	TEST	Red

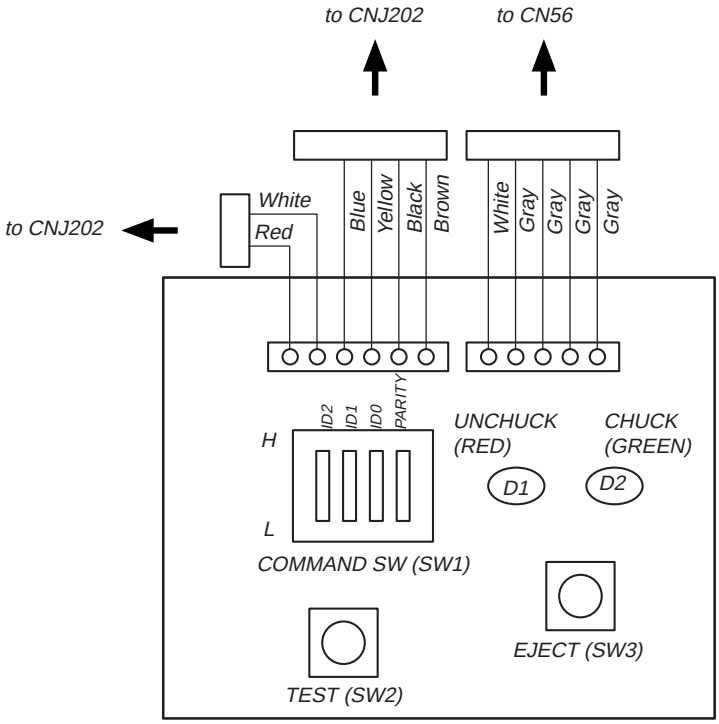
[Disc Chucking/Unchucking Method]
1. Connect the controller.
2. Load a disc directly into the drive with your hand.
3. Press the EJECT button of the controller. The LEDs will go off in the order of red and green.
   When both LEDs go off, it means that both discs have been chucked.
4. To eject the disc, press the EJECT button again.
5. The LEDs light up in the order of green and red. When both LEDs light up, it means that the discs have been unchucked.

NOTE :
If the LEDs remain lit or off even when chucking/unchucking is performed, S51 (red:UNCHUCK), S52 (green:CHUCK) of the CDM-47 LDSW board may be improperly connected.

[Single-Operation of CDM-47]
1. Chuck the disc beforehand.
2. Set the COMMAND SW of the controller to the test mode.

ID2	ID1	ID0	PARITY
H	L	H	H

3. While pressing the TEST button of the controller, turn on the power of the CDL1100 or power supply unit.
4. After about 1 second later, release the TEST button.
5. This sets the test mode. To enter the other mode, refer to the following table, set the dip switch, and press the TEST button.



Setting of Single-Operation Mode

Mode	ID2	ID1	ID0	PARITY
Test Mode	H	L	H	H

Command list of Single-Operation Mode

Mode	ID2	ID1	ID0	PARITY
Initialize	L	L	L	L
x1 speed	L	L	L	H
x4 speed	L	L	H	L
x8 speed	L	L	H	H
x12 (Partial CAV) speed	L	H	L	L
Tracking servo OFF	H	L	L	L
Tracking servo ON	L	H	H	H
PlayAudio (23'47")	L	H	L	H
PlayAudio (5'00")	H	H	L	L
PlayAudio (55'00")	H	H	L	H

6-2-3. SYSTEM CONFIGURATION

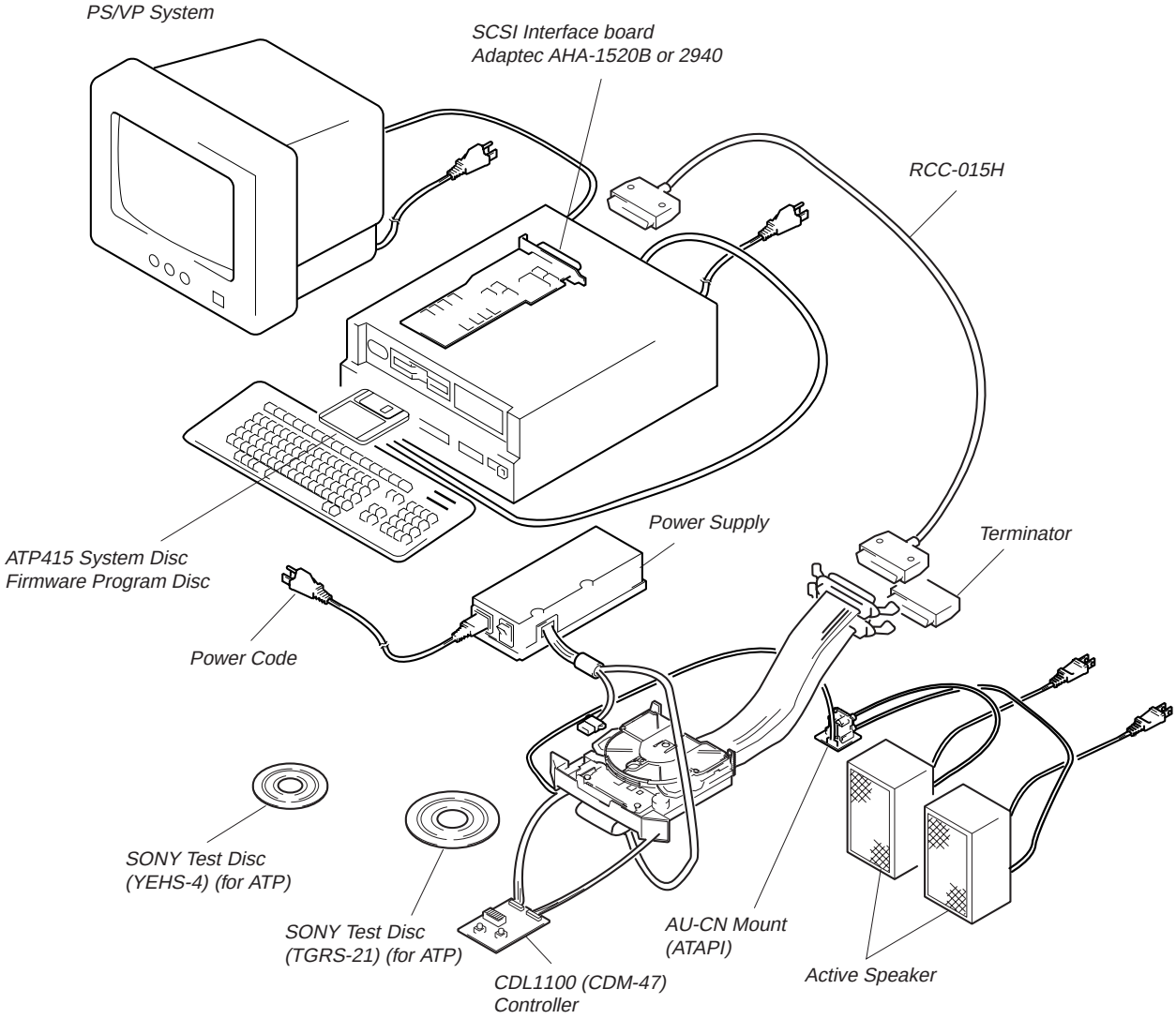
6-2-3-1. Set up PS/VP System

a. Install the ANSI.SYS (Device = ANSI. SYS) and ASPI 2 DOS.SYS in Config. SYS.
   (Refer to Instruction Manual for more detail)
b. Set the jumpers on the Adaptec SCSI Interface board as follows. (Refer to Instruction Manual for Adaptec SCSI board AHA-1520B or 2940 in detail)

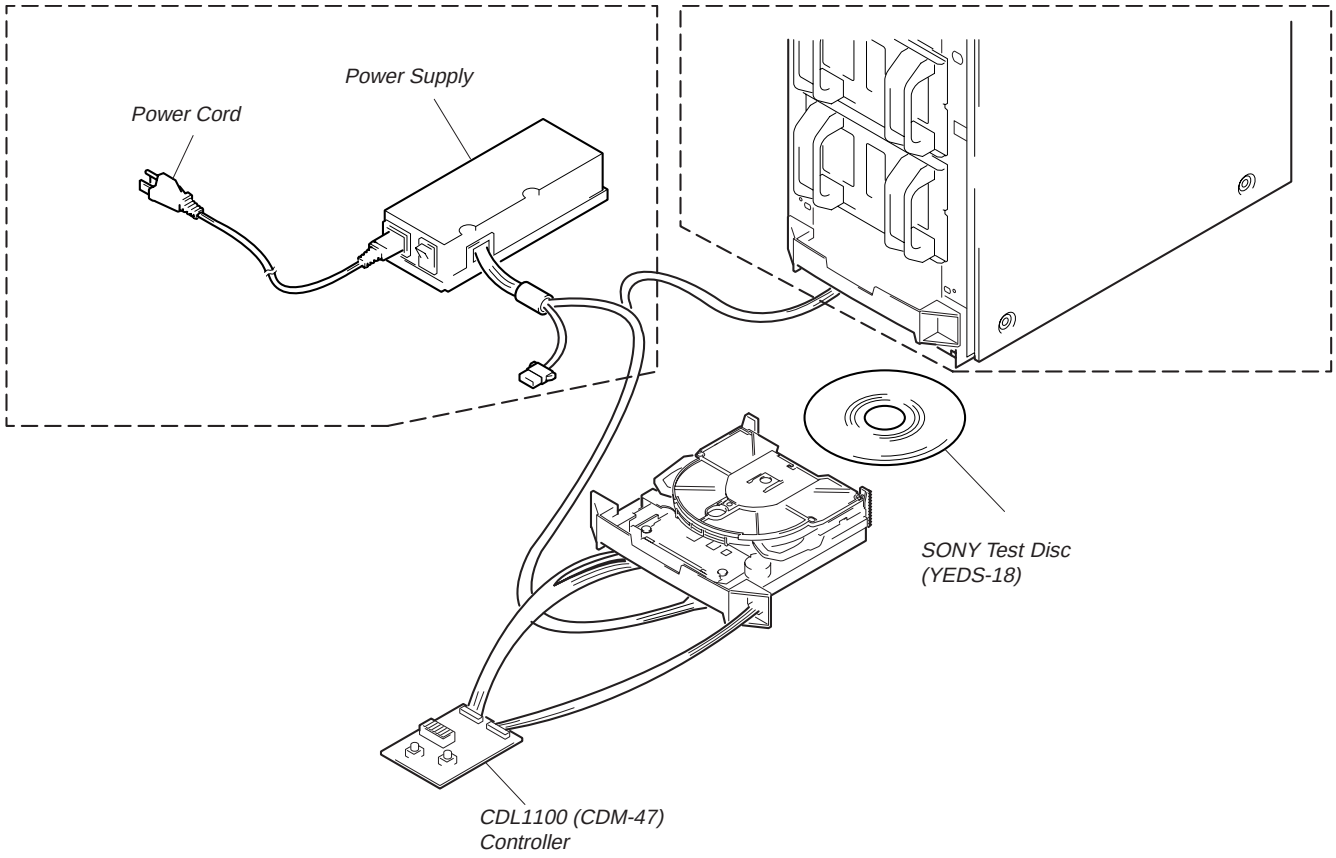
   Setting of SW and Configuration file.

   AHA-1520B (for ISA BUS)…
   All of DIP SW (1 to 4) are OFF.…
   AHA-2940 (for PCI BUS)…
   No Jumper and SW setting on the board.
   Use default parameter for SSI Select configuration utility.
   It is not necessary to install the device driver when using on the windows ’95.
   It is necessary to install the device driver at first line of config. sys when using on DOS.
c. Install the SCSI Interface board in the PS/VP System.

6-2-3-2. System Configuration



ATP/DOWNLOAD System



Function check

6-3. TROUBLE SHOOTING

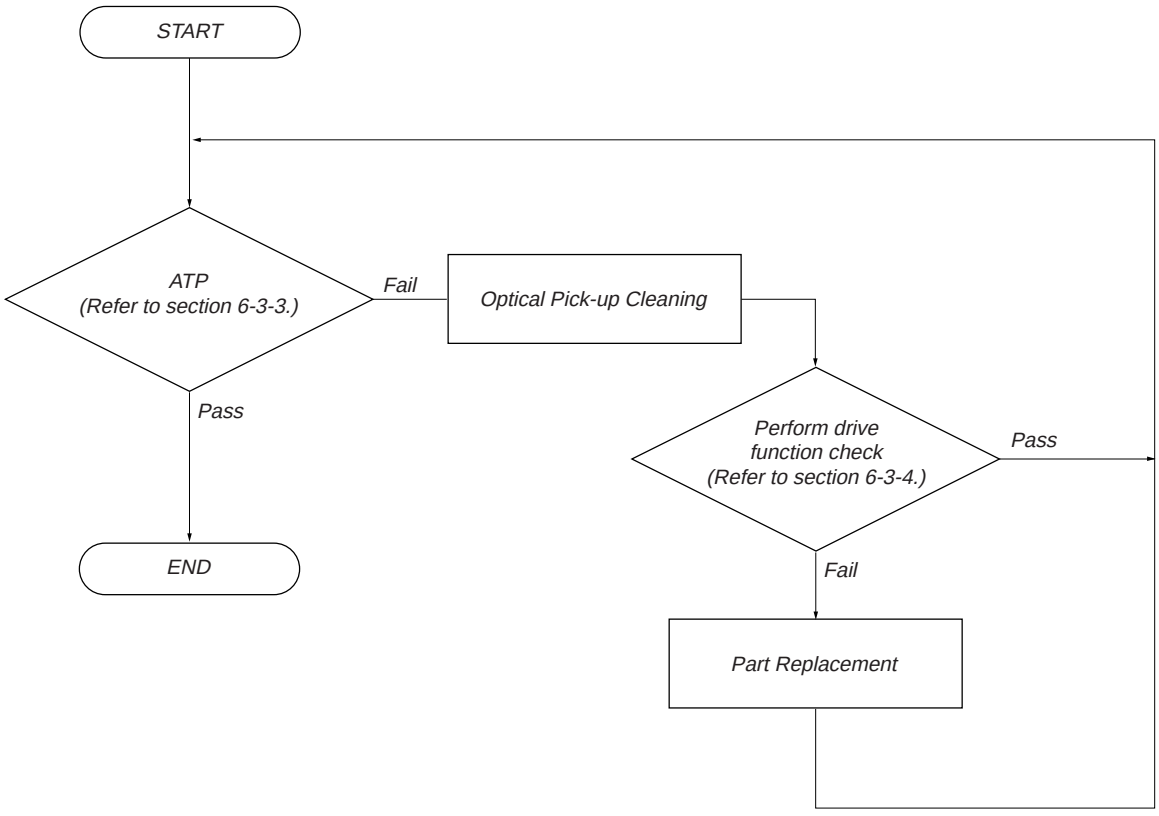
This section describes trouble shooting methods.
Section 6-3-2. shows the flowchart of the processing routine of the unit. Section 6-3-3. describes the ATP procedures. These sections define the detective parts under operating conditions.

6-3-1. BEFORE TROUBLE SHOOTING

The following procedures are recommended to verify if the drive is really faulty or not:

a. Poor connection with the host system
   (esp. GND-related connection, frame GND, etc.)
b. Incorrect operational procedure.
c. Program error of host system
d. No Interface Cable Terminator at the end of Data Bus
e. Wrong Drive Number selection
f. Wrong supply voltage
g. Environmental conditions (where electrical noise easily jumps into signal)
h. Influence of strong magnetic field.

6-3-2. FLOWCHART FOR TROUBLE SHOOTING



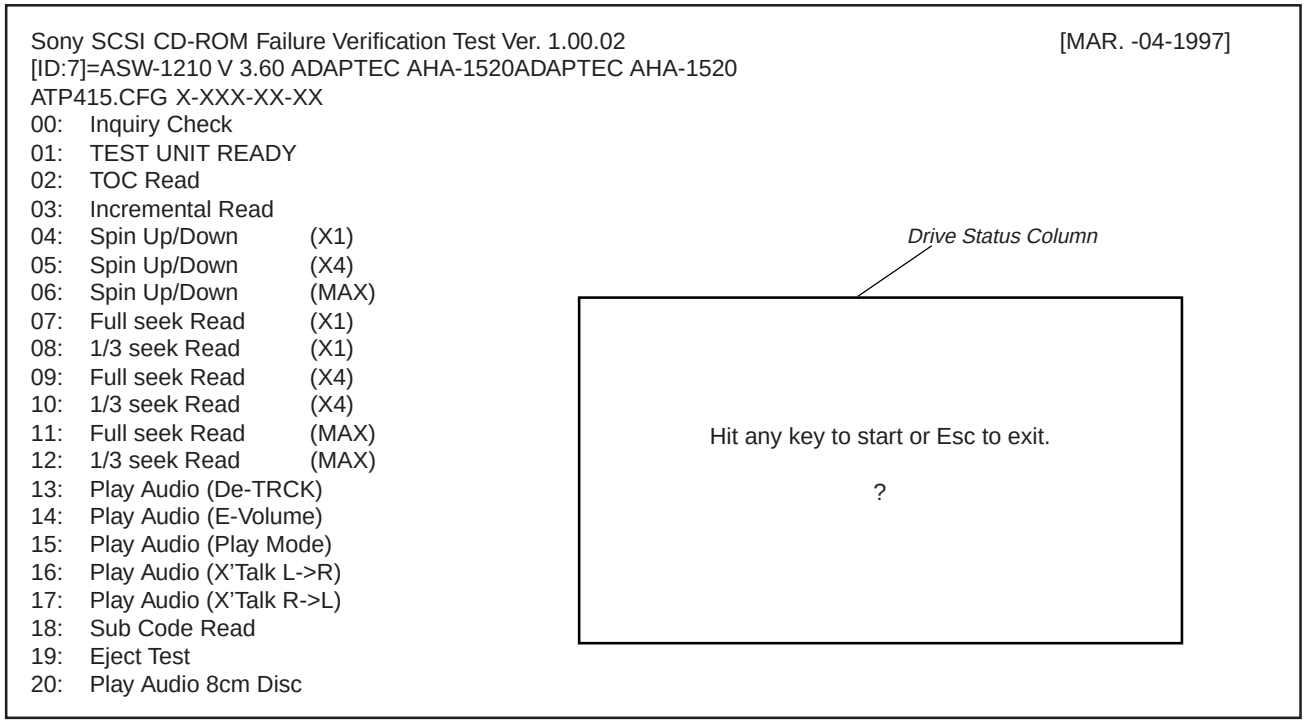
6-3-3. PROCEDURE OF ATP TEST

6-3-3-1. Pre-setting

a. Connect the test drive to the PS/VP System. (Refer to Fig. 2-3-1.)
b. Set the Jumpers on the Adaptec SCSI board. (Refer to Fig. 2-3-1.)
c. Connect the test drive to the CDL1100 (CDM-47) CONTROLLER and set the COMMAND SW as below.

ID2	ID1	ID0	PARITY
H	L	L	L

d. Connect the test drive to the DC power supply.
e. Turn on the power of PS/VP System.
f. After loading the system, "C >" is displayed on the screen. Then, insert ATP415 Disc.
g. Change the directory in the drive A. ("A >" is displayed on the screen.)
h. Type [A] [T] [P] [4] [1] [5] and hit [Enter] key. (After loading the test program, Display 6-3-3-1. (a) shows up.)
i. While pressing the [TEST] button of the CDL1100 (CDM-47) controller, turn on the DC power supply or CDL1100 power, and release the [TEST] button about 1 second later.


Sony SCSI CD-ROM Failure Verification Test Ver. 1.00.02 [MAR. -04-1997]
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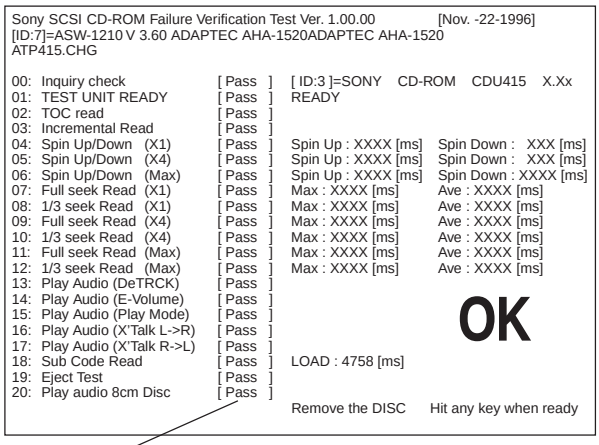
ATP415.CFG X-XXX-XX-XX
00: Inquiry Check
01: TEST UNIT READY
02: TOC Read
03: Incremental Read
04: Spin Up/Down (X1)
05: Spin Up/Down (X4)
06: Spin Up/Down (MAX)
07: Full seek Read (X1)
08: 1/3 seek Read (X1)
09: Full seek Read (X4)
10: 1/3 seek Read (X4)
11: Full seek Read (MAX)
12: 1/3 seek Read (MAX)
13: Play Audio (De-TRCK)
14: Play Audio (E-Volume)
15: Play Audio (Play Mode)
16: Play Audio (X'Talk L->R)
17: Play Audio (X'Talk R->L)
18: Sub Code Read
19: Eject Test
20: Play Audio 8cm Disc
Drive Status Column
Hit any key to start or Esc to exit.
?

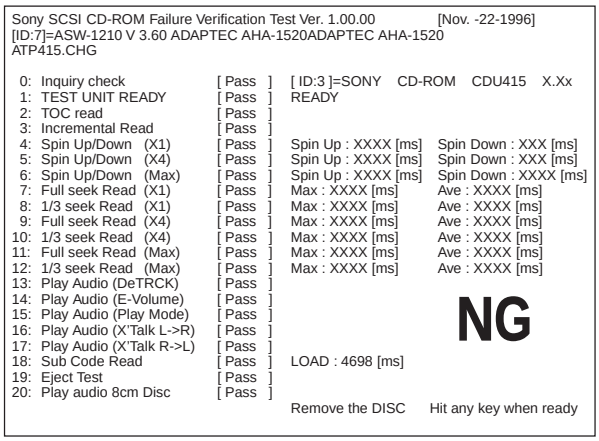
Display 6-3-3-1. (a)

6-3-3-2. Test Procedure

TEST item	Check point
To execute ATP test of the drive. 1. Insert the test disc (TGRS-21) into the CDM-47 drive unit. and hit any key to start ATP test. **Note:** When some errors occurred during the test, " [A]bort [R]etry [I]gnore" message will be displayed i=on the drive status column, at that time hit [A] key to exit and then check which part is broken in accordance with 3-4. **Note:** If each test result satisfies the specification, the word of "Pass" or value of the test result will be displayed on the judgement column. a. Inquity check test will be executed. b. "Returned Data OK ? (Y/N) = >?" message will be displayed on the drive status column, then check the inquiry data and hit [Y] key. c. When "Place CD-ROM TEST DISC (TGRS-2D)..." is displayed, press the [EJECT] button of the CDL1100 (CDM-47) controller, and chuck the disc. If the disc has already been chucked, the display will not be shown, and the unit will proceed onto the next step. d. TOC Read test will be executed. e. Incremental Read Test will be executed. f. Spin Up, Spin Down test (normal) will be executed. g. Spin Up, Spin Down test (quadruple) will be executed. h. Spin Up, Spin Down test (Max) will be executed. i. Full seek test (normal) will be executed. j. 1/3 seek test (normal) will be executed. k. Full seek test (quadruple) will be executed. l. 1/3 seek test (quadruple) will be executed. m. Full seek test (Max) will be executed. n. 1/3 seek test (Max) will be executed.	
2. After Seek test completion, Play Audio (DeTRCK) test will be executed. a. "Hit any key when ready" message will be displayed on the drive status column, then hit any key.	The music (both left and right channel) can be heard from the active speaker.
b. Play Audio (E-Volume) test will be executed.	The music (both left and right channel) will be faded-out slowly. (After several minutes, the drive is set to mute mode.)
c. "Any key when Okay or Esc when NG" message will be displayed on the drive status column, then hit any key.	
d. Play Audio (Play Mode) test will be executed.	The music (both left and right channel) can be heard from the active speaker. And the play mode can be changed by pushing some key.
e. "Space bar when ready, ESC to abort" message will be displayed on drive status column, then hit space bar.	(Refer to Drive Status Column)
f. Play Audio (X'Talk L→R) test will be executed.	The sound (only left channel) can be heard for 3 sec. from the active speaker.
g. "Any key when Okay or Esc when NG" message will be displayed on drive status column, then hit any key.	
h. Play Audio (X'Talk R→L) test will be executed.	The sound (only lright channel) can be heard for 3 sec. from the active speaker.
i. "Any key when Okay or Esc when NG" message will be displayed on drive status column, then hit any key.	
3. After Audio test completion, Sub Code Read test will be executed.	

TEST item	Check point
4. After sub code Read test completion, Eject test will be executed. a. "push eject button" message will be displayed on drive status column, then push the eject button b. "Place a YEHS-4 (8cm disc Type5) then push the tray until it starts to close." message will be displayed on the drive status column, then insert SONY Test Disc (YEHS-4) to the test drive instead of SONY Test Disc (TGRS-21). Press the EJECT button of the CDL1100 (CDM-47) controller, and chuck the disc. If the 8 cm disc is not available, the disc needs not to be set again. c. Play Audio 8 cm Disc test will be executed. 5. After Play Audio 8 cm Disc test completion, Tray will be opened automatically. The ATP test ends. **Note:** If all of test items are completed, words of OK will be displayed on the screen.If not, NG will be displayed.	The disc will automatically be unchucked, after it will be chucked again. Press the EJECT button of the CDL1100 (CDM-47) controller to unchuck the disc, and then remove the disc.


Sony SCSI CD-ROM Failure Verification Test Ver. 1.00.00 [Nov. -22-1996]
[ID:7]=ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
ATP415.CHG
00: Inquiry check [Pass] [ID:3]=SONY CD-ROM CDU415 X.Xx
01: TEST UNIT READY [Pass] READY
02: TOC read [Pass]
03: Incremental Read [Pass]
04: Spin Up/Down (X1) [Pass] Spin Up : XXXX [ms] Spin Down : XXX [ms]
05: Spin Up/Down (X4) [Pass] Spin Up : XXXX [ms] Spin Down : XXX [ms]
06: Spin Up/Down (Max) [Pass] Spin Up : XXXX [ms] Spin Down : XXXX [ms]
07: Full seek Read (X1) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
08: 1/3 seek Read (X1) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
09: Full seek Read (X4) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
10: 1/3 seek Read (X4) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
11: Full seek Read (Max) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
12: 1/3 seek Read (Max) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
13: Play Audio (DeTRCK) [Pass]
14: Play Audio (E-Volume) [Pass]
15: Play Audio (Play Mode) [Pass]
16: Play Audio (X'Talk L->R) [Pass]
17: Play Audio (X'Talk R->L) [Pass]
18: Sub Code Read [Pass] LOAD : 4758 [ms]
19: Eject Test [Pass]
20: Play audio 8cm Disc [Pass]
OK
Remove the DISC Hit any key when ready


Sony SCSI CD-ROM Failure Verification Test Ver. 1.00.00 [Nov. -22-1996]
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1: TEST UNIT READY [Pass] READY
2: TOC read [Pass]
3: Incremental Read [Pass]
4: Spin Up/Down (X1) [Pass] Spin Up : XXXX [ms] Spin Down : XXX [ms]
5: Spin Up/Down (X4) [Pass] Spin Up : XXXX [ms] Spin Down : XXX [ms]
6: Spin Up/Down (Max) [Pass] Spin Up : XXXX [ms] Spin Down : XXXX [ms]
7: Full seek Read (X1) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
8: 1/3 seek Read (X1) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
9: Full seek Read (X4) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
10: 1/3 seek Read (X4) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
11: Full seek Read (Max) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
12: 1/3 seek Read (Max) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
13: Play Audio (DeTRCK) [Pass]
14: Play Audio (E-Volume) [Pass]
15: Play Audio (Play Mode) [Pass]
16: Play Audio (X'Talk L->R) [Pass]
17: Play Audio (X'Talk R->L) [Pass]
18: Sub Code Read [Pass] LOAD : 4698 [ms]
19: Eject Test [Pass]
20: Play audio 8cm Disc [Pass]
NG
Remove the DISC Hit any key when ready

Note:
When not using the 8 cm disc, "20:Play audio 8 cm Disc" will become an error.
As a result, NG will be displayed. If there is no other error, it will be regarded as OK.

6-3-4. DRIVE FUNCTION CHECK

Since CDM-47 models is adjustment-free drive, there is no potentiometer fo electrical adjustment in the MA-C22 Mounted Board. Therefore BU or MA Mounted Board can be swapped over without any manual adjustment so that you will easily find defective components (if the trouble depends on BU or MA Mounted Board). (Refer to 6-3-4-2.)

Note: All of adjustment items, will be automatically performed after power-on by the function of CD DSP IC.
The page 6-15 shows the sequence of execution items in Power-On Reset Actions. It will help you finding any defective point on the drive to know the specified processing sequence of the auto adjustment items and drive's action in the Power-On Reset Actions.

Preparing

a. The following tools and measuring equipments are necessary for performing this section.
DC Power Supply or CDL1100 unit
Oscilloscope
Sony Test Disc (YEDS-18) (3-702-101-01)
CDL1100 (CDM-47) CONTROLLER (J-2501-141-A)

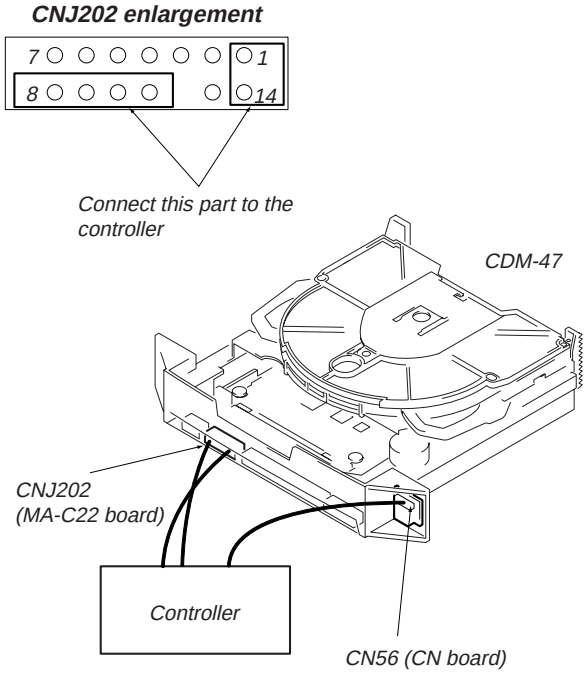
b. Connect the test drive to the DC power supply or CDL1100 unit.

6-3-4-1. Pre-Setting for Test Mode Operation

Note: This section is performed only specified following sections.

Note: This section describes usages of Test Mode Operation and signal checking on the CDM-47 drives with the CDL1100 (CDM-47) CONTROLLER.

a. Connect CDM-47 to CDL1100 (CDM-47) CONTROLLER as shown in following Fig. 3-4-1.



b. See the COMMAND SW ON CDL1100 (CDM-47) CONTROLLER as following table.

ID2	ID1	ID0	PARITY
H	L	H	H

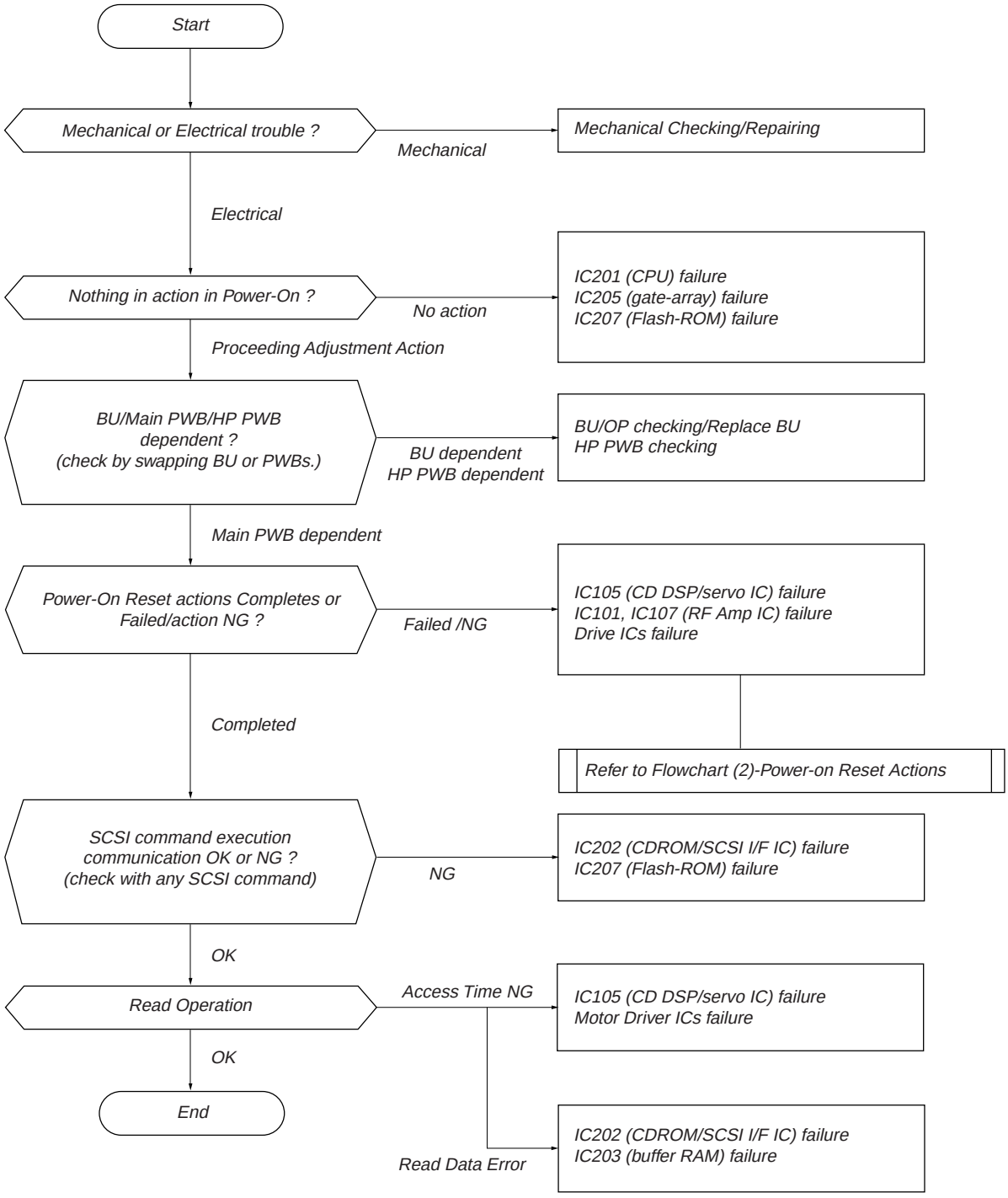
c. While pressing the TEST button of the controller, turn on the power of the CDL1100 or power supply unit.

d. After about 1 second later, release the TEST button.

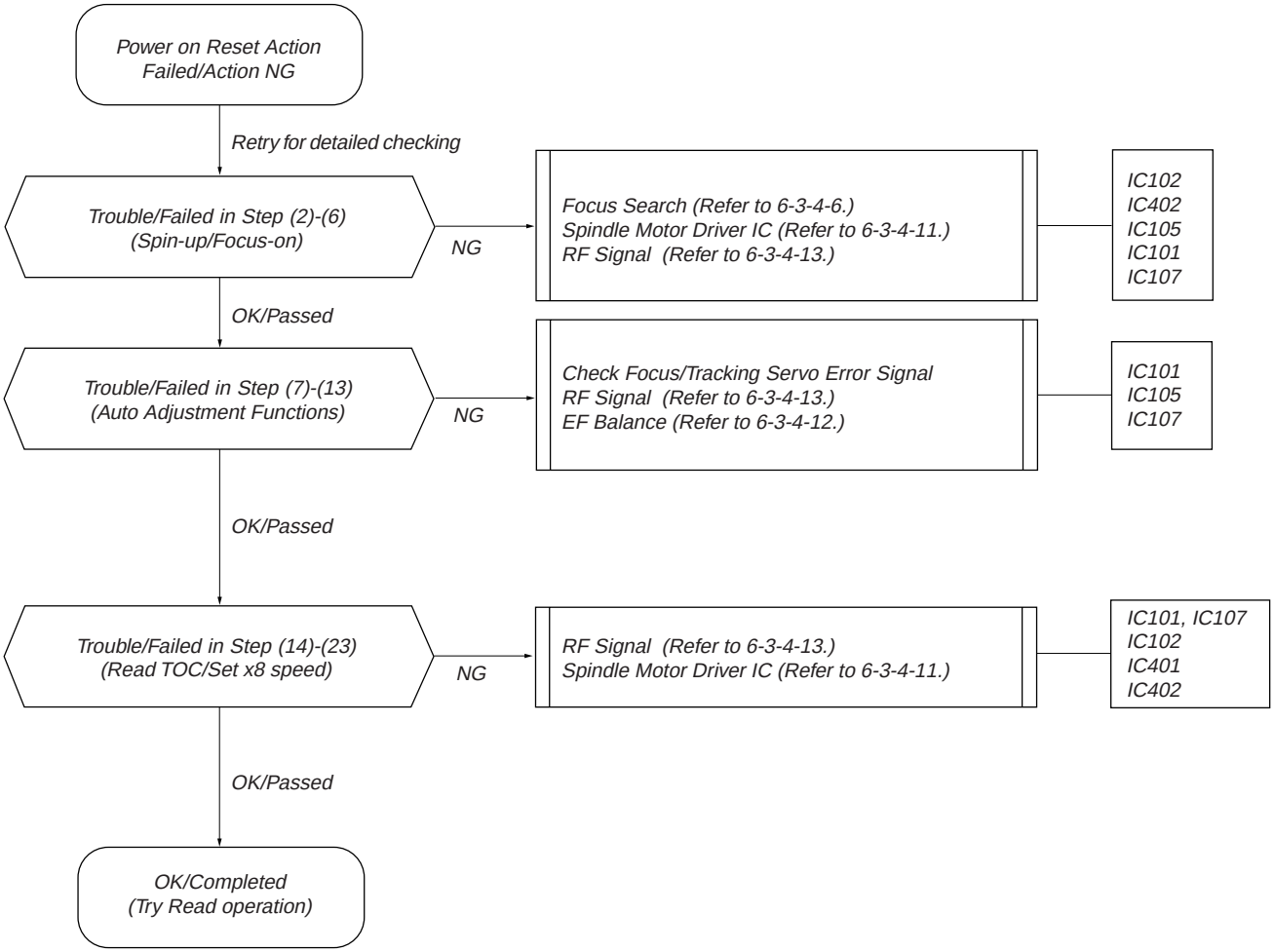
Note: Even drive is Test Mode, EJECT button is activated.

6-3-4-2. Flowchart

Note: These flowchart is described assuming that IC failure causes any trouble.



Flowchart (1) Repairing/Trouble Shooting-General



Flowchart (2) Repairing/Trouble Shooting-Power-on Reset Actions

Power on Reset Actions

Step	Item	Drive Action
(1)	Drive Power-On	LED to indicate Amber
(2)	Spin-up (tentative spindle servo gain setting)	Spin-Up
(3)	LD On	LD to turn on
(4)	Spindle Kick	
(5)	Focus Search	OP lens to move up and down
(6)	Focus On	
(7)	EF Balance Auto Adjustment	
(8)	Tracking and Sled Servo On	
(9)	Spindle Servo On	
(10)	— sync pattern detection —	
(11)	Focus Servo Gain Auto Adjustment	(You will hear a small beep sound from the drive during these auto adjustment.)
(12)	Track Servo Gain Auto Adjustment	
(13)	Focus Bias Voltage Auto Adjustment	(You will hear a small beep sound from the drive during these auto adjustment.)
(14)	Disc Diameter (8cm/12cm) Detection	(You will see RF Signal with Spindle-Kicking waveform.) (Refer to 6-3-4-13)
(15)	— sync pattern detection —	
(16)	Change rotational speed from X1 to X4 (ex. Yellow Disc)	
(17)	Read TOC	
(18)	Jump to 00:02:00	
(19)	— Subcode-Q detection —	
(20)	Disc Linear Speed Detection	
(21)	Jump to 00:02:00	
(22)	Set MAX. rotational speed	
(23)	— sync pattern detect & subcode-Q detection— — Completed —	

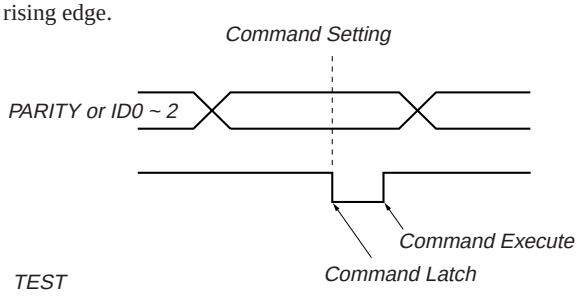
Note: When a disc is replaced, the above steps excluding item (1) to (3) will be executed.
The item (1) to (3) will be performed only after power-on.

6-3-4-3. Test Command List

ID2	ID1	ID0	PARITY	Drive Action
L	L	L	L	Initialize Drive
L	L	L	H	Set Normal Speed
L	L	H	L	Set Quadruple Speed
L	L	H	H	Set x8 Speed (Wide Capture) for Error Rate
L	H	L	H	Play Audio (from 23'47")
L	H	H	H	Tracking Servo on
H	L	L	L	Tracking Servo off
H	H	L	L	Play Audio (from 5'00")
H	H	L	H	Play Audio (from 55'00")
H	L	L	H	Set x8 Speed (Normal Capture) for RF Level/RF Jitter
L	H	L	L	Partial CAV

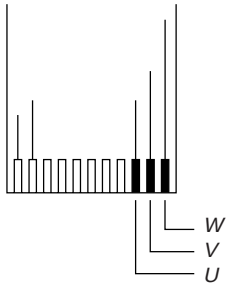
H : PARITY or ID0 ~ 2 test point to be high (5V).
L : PARITY or ID0 ~ 2 test point to be low (Ground).

Command Execute
In the test mode, above listed function can be executed. Turn on COMMAND SW on CDL1100 (CDM-47) CONTROLLER.
The command will be latched by TEST down edge, and executed by rising edge.



6-3-4-4. Spindle Motor

[Check resistance]
a. Pull the spindle motor flexible cable out from the connector.
b. Measure the resistance between 3 motor terminals respectively (u-v, v-w, w-u).
c. The resistance shall be 15Ω ± 10%.
d. Otherwise replace the motor.



[Check noise from spindle motor]
a. Listen carefully the sound from the spindle motor while drive is spinning up.
b. If you hear the strong striking noise from the motor, it is suspected that there is too much clearance between the bearing metal and the shaft, that is; NG motor!!

6-3-4-5. Sled Gear Train

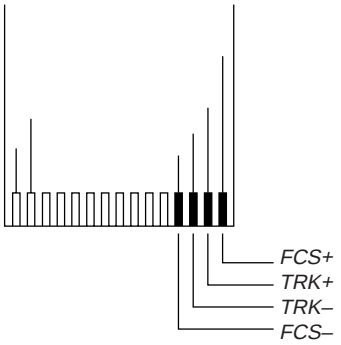
[Check the mechanical burden]

a. Disassemble the CHUCK HOLDER.
b. Check if there is any broken tooth in the gears.
c. Try to move sled gears by hand and check if it gets unsmooth in certain position.
d. In case there is unsmooth protion, replace Base Unit Ass'y.

6-3-4-6. 2-Axis Actuator

[Check Focus search operation]

a. Disassemble the CHUCK HOLDER so that the optical pick-up is exposed.
b. Turn on the drive power and watch if the objective lens moves upward and downward.
c. If the lens does not move, check the resistance of the 2-axis actuator coils. It should be 6.1±1.1Ω between FCS+ and FSC–.



d. Otherwise replace the optical device.
e. If the coils are normal, replace the Driver IC (IC102).

6-3-4-7. Focusing (Focus Bias)

a. Insert any discs into the drive after the check of 6-3-4-4.
b. Check if the drive can make a focus.
c. In case of failure, it is possible that Focus Bias or Focus Gain Servo circuit had not been controlled well.
d. So watch RF signal by a oscilloscope and see if the quality is good or not.
e. In case the quality is not good, check servo circuit.

6-3-4-8. Laser Power

[Check Laser beam]

a. Disassemble the drive so that the optical device is exposed.
b. Turn on the drive power and look into the objective lens carefully while the drive is in process of focus search.
c. Check if the red beam comes out from the optical pick-up.
Warning: Do not look into LD beam closely with naked eyes.
d. In case of no beam from optical device, the LD must have been broken down, so replace the optical pick-up.

[Check Laser Current]

a. Touch the IOP test land (CL165) on the MA-C22 Mounted Board.
b. Measure the voltage generated by the laser current while the drive in process of focus search.
c. It is supposed to be about 4.5V because the voltage of IOP will drop by IOP x10Ω from 5V-A.
d. Otherwise replace the optical pick-up.

6-3-4-9. Chucking Mechanism

a. Listen the sound from the drive while the drive is spinning up.
b. Check if there is any slipping noise among the Turntable, the Chucking Pulley Ass'y and the Disc.
c. If you hear any, disassemble the drive and check if there is excessive dust or any contamination on the Turntable or the disc.
d. Otherwise replace the Chucking Pulley Ass'y.

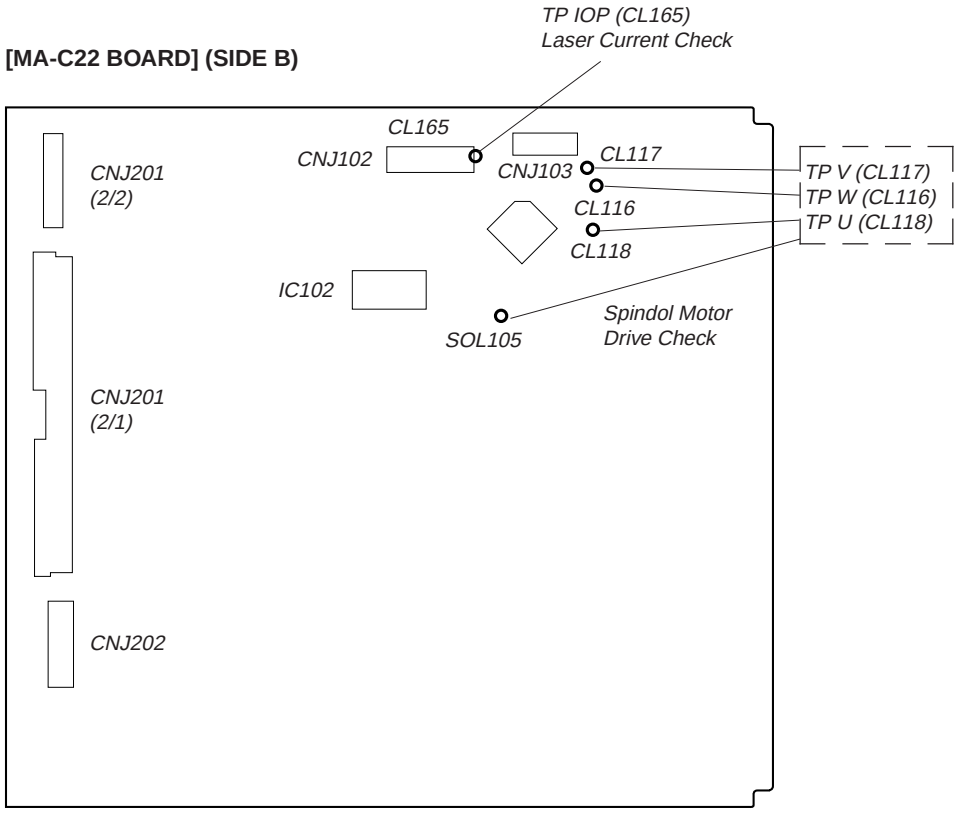
6-3-4-10. Sled Motor

a. Disconnect the Sled Motor wires from the P.W.B.
b. Check the resistance between 2 terminals of sled motor.
c. It should be 20.3 ± 1.9Ω.

6-3-4-11. Spindle Motor Drive

Monitor the following signals to find if IC402 is defective.
a. Check the control signal at SOL105. In CAV mode the control signal is sent from IC106 No.15 pin.
   In CLV mode that is sent from IC105 No.50 pin with 3-state drive signal.
b. Check if the voltage difference between VH+ (IC402 30 pin) and VH– (IC402 29 pin) shows approximately 1.0V. (This voltage shows Hall Elements Bias Voltage for Spindle Motor)
c. Check if U (CL118), V (CL117), W (CL116) OUT signal shows motor driving voltage.

[MA-C22 BOARD] (SIDE B)



6-3-4-12. EF Balance

Note:
- Before performing electrical block checks, solder a lead wire to TP RF (CL428), TP VC (CL403), and TP TE (CL407) of the MA-C22 board.
- Chuck the disk (YEDS-18) beforehand.
- Refer to 6-3-4-1. and set the test mode.
- Insert a SONY test disc (YEDS-18) into the test drive.

1. Connect the oscilloscope to TP TE (CL407) and TP VC (CL403) of the MA-C22 board.
2. Set the COMMAND SW of the controller to INITIALIZE and press the TEST button.

ID2	ID1	ID0	PARITY
L	L	L	L

3. Set the COMMAND SW of the controller to x1 speed, and press the TEST button.

ID2	ID1	ID0	PARITY
L	L	L	H

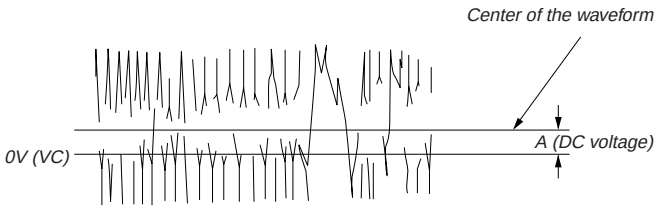
4. Set the COMMAND SW of the controller to Play Audio (23'47"), and press the TEST button.

ID2	ID1	ID0	PARITY
L	H	L	H

5. Set the COMMAND SW of the controller to tracking off, and press the TEST button.

ID2	ID1	ID0	PARITY
H	L	L	L

6. The oscilloscope waveform should be symmetrical at the top and bottom in respect to 0V (VC).
   Check that the DC voltage A is within ±0.125V from 0V (VC).



7. After adjusting, set the COMMAND SW of the controller to tracking on, and press the TEST button.

ID2	ID1	ID0	PARITY
L	H	H	H

6-3-4-13. RF Level

Note:
- Before performing electrical block checks, solder a lead wire to TP RF (CL428), TP VC (CL403), and TP TE (CL407) of the MA-C22 board.
- Chuck the disk (YEDS-18) beforehand.
- Refer to 6-3-4-1. and set the test mode.

1. Connect the oscilloscope to TP RF (CL428) and TP VC (CL403) of the MA-C22 board.
2. Set the COMMAND SW of the controller to INITIALIZE and press the TEST button.

ID2	ID1	ID0	PARITY
L	L	L	L

3. Set the COMMAND SW of the controller to x1 speed, and press the TEST button.

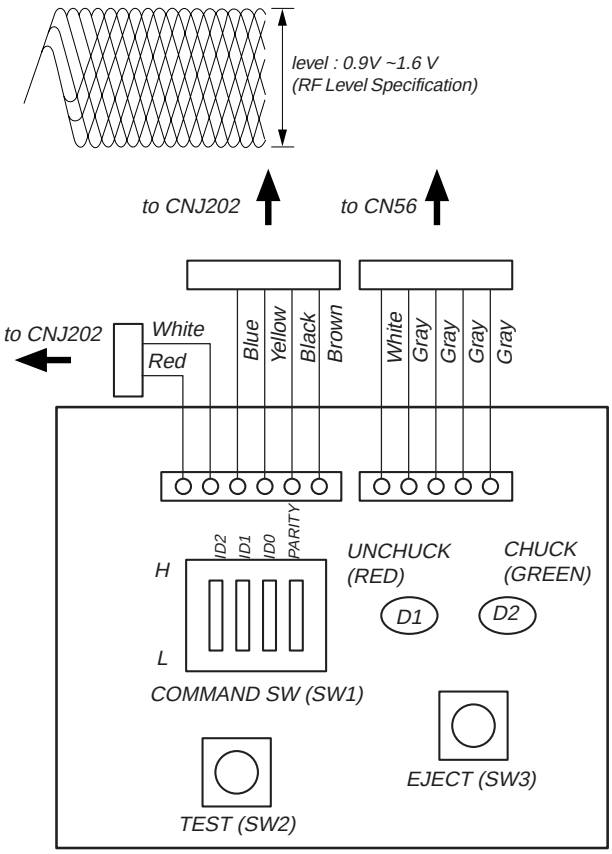
ID2	ID1	ID0	PARITY
L	L	L	H

4. Set the COMMAND SW of the controller to Play Audio (23' 47"), and press the TEST button.

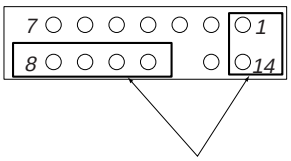
ID2	ID1	ID0	PARITY
L	H	L	H

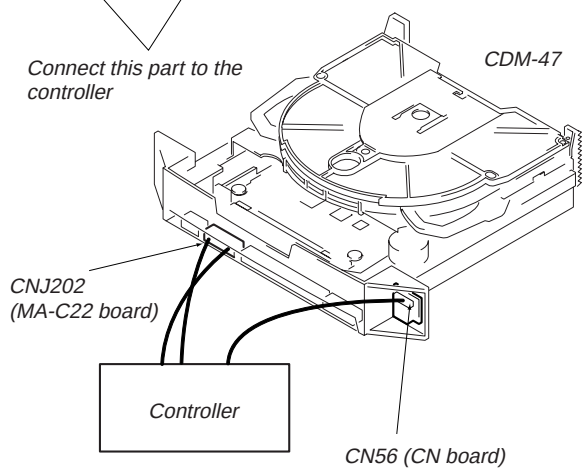
5. Check that the oscilloscope waveform is clear, and the RF level is proper.

* A clear RF signal waveform is as follows.

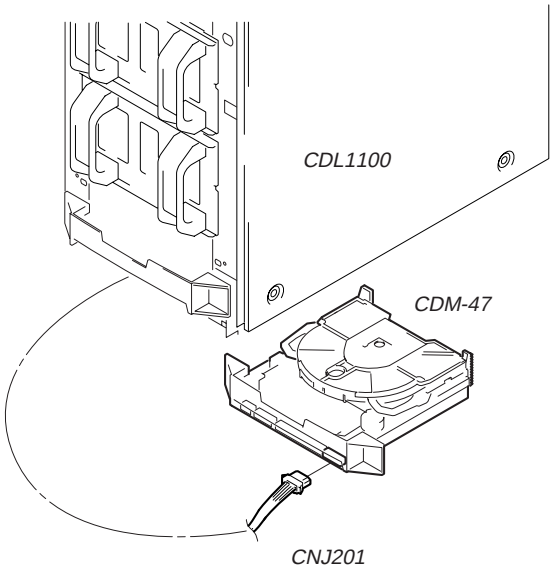


CNJ202 enlargement



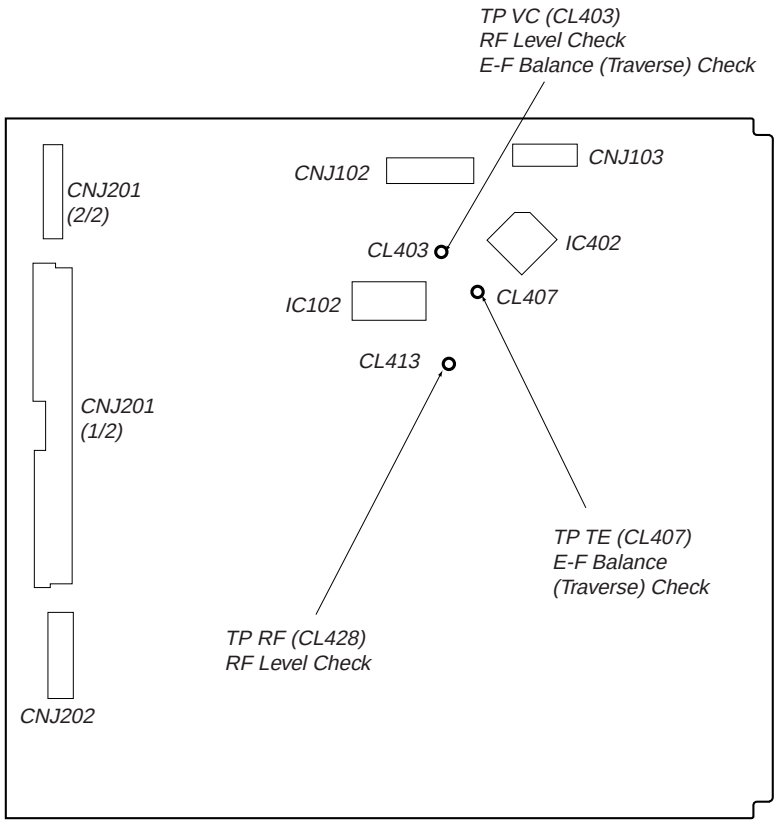


Supplying power from the CDL1100 unit



Adjustment Location :

[MA-C22 BOARD] — Side B —



6-3-5. DOWN LOAD PROGRAM

a. Connect the drive to the host computer as shown in 6-2-3-1.
b. Set the COMMAND SW of the CDL1100 (CDM-47) CONTROLLER as follows.

ID2	ID1	ID0	PARITY
H	L	L	L

c. While pressing the [TEST] button of the CDL1100 (CDM-47), turn on the power of the CDL1100 or power supply unit. After about 1 second later, release the [TEST] button and then turn the computer on.
d. After system loading, insert Firmware Program Disk into the drive A.
e. Change the directory in the drive A.
f. Type [G] [O] and hit [Enter] key. (Display 6-3-5. (a) shows up.)

```
Firmware DownLoad VIA ASPI Ver.1.00.00  --Sony CD-ROM --                [Nov. -21-1996]
[ID:7]=ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
Size of OBJ. [415s_XXx. HEX ] => 065536 Bytes. Accept? (Y/N) ==>?
```

Display 6-3-5 (a)

g. Hit [Y] key. (Display 6-3-5. (b) shows up.)

```
Firmware DownLoad VIA ASPI Ver.1.00.00  --Sony CD-ROM --                [Nov. -21-1996]
[ID:7]=ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
Size of OBJ. [415s_XXx. HEX ] => 065536 Bytes.

[ID:3]=SONY CD-ROM CDU-415 X.Xx          [Available ROM size:064 kBytes)
                                         Accept? (Y/N) ==>?
```

Display 6-3-5 (b)

h. Hit [Y] key.
i. Hit [Enter] key to start the down loading.(It takes a few minutes). (Display 6-3-5. (c) shows up.)

```
Firmware DownLoad VIA ASPI Ver.1.00.00  --Sony CD-ROM --                [Nov. -21-1996]
[ID:7]= ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
Size of OBJ. [415s_XXx. HEX ] => 065536 Bytes.

[ID:3]= SONY     CD-ROM CDU-415 X.Xx          [ID:3]=SONY     CD_ROM CDU-415 X.Xx

[ID:3]  Downloading INQUITY data.                               Complete.
[ID:3]  Downloading ROM data. [00000 ~03FFF]                    Complete.
[ID:3]  Downloading ROM data. [04000 ~07FFF]                    Complete.
[ID:3]  Downloading ROM data. [08000 ~0BFFF]                    Wait for a moment...
```

Display 6-3-5 (c)

Note: When the firmware has the different inquiry data from the current drive, the warning message appears. (Display 6-3-5. (d) shows up.) Inthis case, hit [ESC] key to quit.

```
Firmware DownLoad VIA ASPI Ver.1.00.00  --Sony CD-ROM --                [Nov. -21-1996]
[ID:7]=ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
Size of OBJ. [415s_XXx. HEX ] => 065536 Bytes.

[ID:3]=SONY CD-ROM CDU-XXX X.Xx          [Available ROM size:064 kBytes)


Hit Esc to quit.
```

Display 6-3-5 (d)

Note: When the down loading and verification are completed, "OK" shows up on the display. (Refer to Display 6-3-5. (e))
When this process is not completed, change ROM (IC207) with new one and try down load process again.
Note: When you want to down load other versions, hit any key. (Display 6-3-5. (a) shows up.)

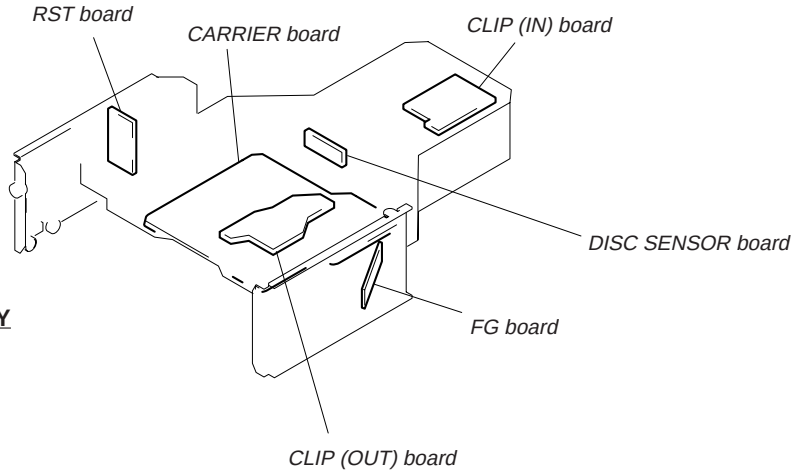
```
Firmware DownLoad VIA ASPI Ver.1.00.00  --Sony CD-ROM --                [Nov. -21-1996]
[ID:7]=ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
Size of OBJ. [415s_XXx. HEX ] => 065536 Bytes.

   [ID:3]= SONY CD-ROM CDU-415 X.Xx          [ID:3]=SONY  CD_ROM CDU-415 X.Xx

   [ID:3]  Downloading INQUITY data.                    Complete.
   [ID:3]  Downloading ROM data. [00000 ~03FFF]         Complete.
   [ID:3]  Downloading ROM data. [04000 ~07FFF]         Complete.
   [ID:3]  Downloading ROM data. [08000 ~0BFFF]         Complete.
   [ID:3]  Downloading ROM data. [0C000 ~0FFFF]         Complete.
   [ID:3]  Self resetting                               Complete.
   [ID:3]  Verifying ROM data. [00000 ~03FFF]           Complete.
   [ID:3]  Verifying ROM data. [04000 ~07FFF]           Complete.
   [ID:3]  Verifying ROM data. [08000 ~0BFFF]           Complete.
   [ID:3]  Verifying ROM data. [0C000 ~0FFFF]           Complete.
                                                        OK

Hit any key to continue, or Esc to abort.
```

Display 6-3-5 (e)

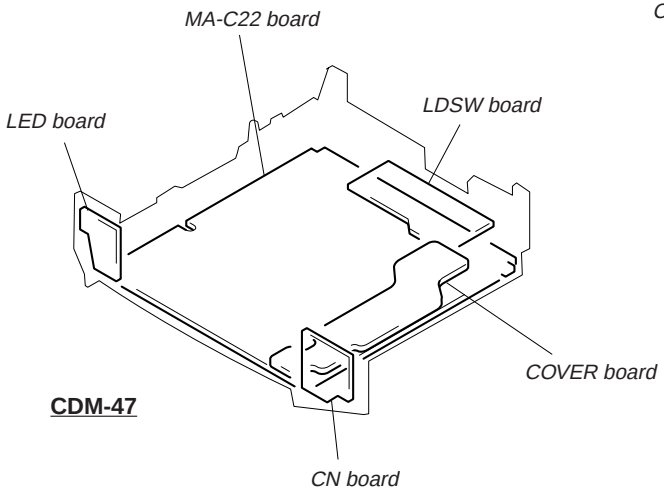
j. Quit this program by hitting ESC key.

SECTION 7
DIAGRAMS

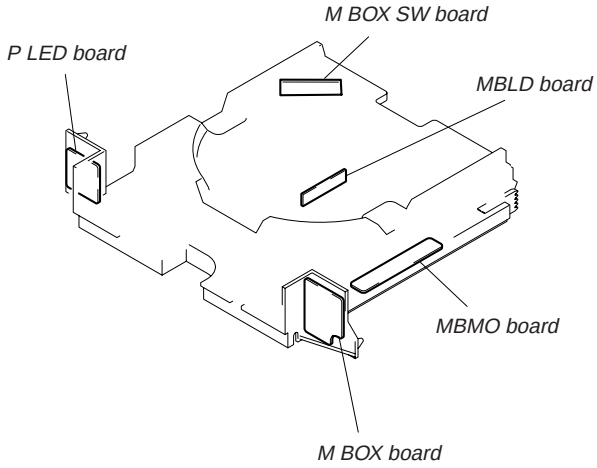
7-1. CIRCUIT BOARDS LOCATION



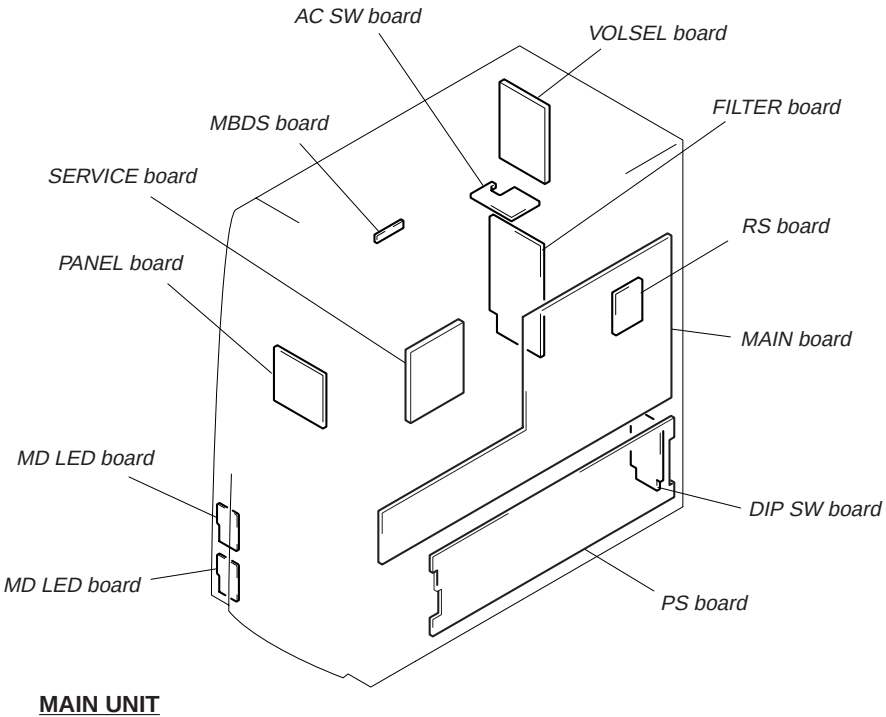
CARRIER ASSY



CDM-47



MAIL BOX ASSY



MAIN UNIT

7-2. IC PIN FUNCTION

• IC101 RF AMP (TA2106N) / MA-C22 board

Pin No.	Pin Name	I/O	Function
1	VCC	—	+5V power supply
2	AGCAD	I	RF system AGC AMP gain adjustment input (Not used)
3	RFAD0	I	RF AMP gain adjustment input
4	FNI	I	Main beam AMP input (Detector A,C)
5	FPI	I	Main beam AMP input (Detector B,D)
6	TPI	I	Sub beam AMP input (Detector F)
7	TNI	I	Sub beam AMP input (Detector E)
8	MDI	I	Monitor photodiode AMP input
9	LDO	O	Laser diode AMP output
10	SEL	I	APC circuit ON/OFF signal, LDO pin control input, and bottom/peak detection frequency switching terminal *1
11	TEB	I	Tracking error balance control signal input controlled with temary PWM signal (PWM carrier = 88.2kHz)
12	2VRO	O	Reference voltage (2VREF) output (+4.2V)
13	TEN	I	Tracking error signal generating AMP inverted phase input
14	TEO	O	Tracking error signal generating AMP output
15	SBAD	O	Sub beam addition signal output
16	FEO	O	Focus error signal generating AMP output
17	FEN	I	Focus error signal generating AMP inverted phase input
18	SEB	I	RFRP generating circuit mode selection input *2
19	VRO	O	Reference voltage (VREF) output (+2.1V)
20	RFRP	O	Track count signal generating AMP output
21	BTC	I	Bottom detection constant adjustment terminal for RFCT signal generation
22	RFCT	O	RFRP signal center level output
23	PKC	I	Peak detection constant adjustment terminal for RFCT signal generation
24	RFRPIN	I	Track count signal generating AMP input
25	RFGO	O	RF signal output
26	AGCIN	I	RF signal amplitude control AMP input
27	RFO	O	RF signal generation AMP output
28	GND	—	Ground
29	RFN2	I	RF signal generation AMP input
30	RFGC	I	RF amplitude control signal input RFGC input voltage : 0.5 to 3.5V AGC AMP transfer gain : 0.8 to 1.7 times (typical)

*1

SEL	APC circuit	LDO	Detection frequency
L	OFF	Connected to VCC Via 1kΩ	Low
HiZ	ON	Outputs control signal	Low
H	ON	Outputs control signal	High

*2

SEB	Bottom detection	Peak detection
L	ON	ON
H	OFF	ON

• **IC102 2AXIS & Chucking Motor Driver (LA6539M) / MA-C22 board**

Pin No.	Pin Name	I/O	Function
1	RF	—	Sub straight (Minimum potential) (not used)
2	RF	—	Sub straight (Minimum potential) (not used)
3	GND	—	Ground
4	VIN1	I	Chucking motor control signal input
5	VIN1A	I	Chucking motor control signal input (For adjusting gain)
6	MUTE1	O	Chucking motor control ON/OFF signal output
7	VIN2	I	Focus coil contol signal input
8	VIN2A	I	Focus coil contol signal input (For adjusting gain)
9	VIN3	I	Tracking coil control signal input
10	VIN3A	I	Tracking coil control signal input (For adjusting gain)
11	OUT1	O	Buffer amplifier 1 output (1/2VS1:typ), CH-U output step reference voltage (Not used)
12	OUT2	O	Buffer amplifier 2 output (1/2VS2:typ), CH-V,W output step reference voltage (Not used)
13	VCC	—	+12V power supply
14	RF	—	Sub straight (Minimum potential) (not used)
15	RF	—	Sub straight (Minimum potential) (not used)
16	RF	—	Sub straight (Minimum potential) (not used)
17	RF	—	Sub straight (Minimum potential) (not used)
18	NC	—	Not used
19	MUTE2	O	Focus/Tracking coil drive signal ON/OFF control output
20	VS2	I	Focus/Tracking coil drive signal output step power supply (+5V)
21	WOUT-	O	Tracking coil drive signal reversed output
22	WOUT+	O	Tracking coil drive signal output
23	VOUT-	O	Focus coil drive signal reversed output
24	VOUT+	O	Focus coil drive signal output
25	UOUT-	O	Chucking motor drive signal reversed output
26	UOUT+	O	Chucking motor drive signal output
27	VS1	I	Chucking motor drive signal output step power supply (+5V)
28	VREF1	—	Level shift circuit reference voltage (+2.1V)
29	RF	—	Sub straight (Minimum potential) (not used)
30	RF	—	Sub straight (Minimum potential) (not used)

• **IC105 Digital Servo & Digital Signal Processor (TC9439F) / MA-C22 board**

Pin No.	Pin Name	I/O	Function
1	VSS	—	Ground
2	BCK	O	Bit clock output (1.4122MHz)
3	AOUT	O	Audio data output
4	DOUT	O	Digital output (Not used)
5	MBOV	O	Buffer memory over signal otuput "H": at over
6	IPF	O	Outputs the correction flag. This pin becomes "H" when the AOUT output cannot be corrected in the C2 correction
7	SBOK	O	Outputs the CRCC judging result of subcode Q data. This pin becomes "H" when the judging result is OK (Not used)
8	CLCK	I/O	Inputs the clock for subcode P-W data reading selectable by command bit
9	VDD	—	+5V power supply
10	VSS	—	Ground
11	DATA	O	Subcode P-W data output
12	SFSY	O	Frame sync signal output (Signal in regeneration system)
13	SBSY	O	Subcode block sync signal output. "H" at S1 position when subcode sync is detected
14	SPCK	O	Clock output for processor status signal reading (176.4kHz) (Not used)
15	SPDA	O	Processor status signal output (Not used)
16	COFS	O	Output the frame clock in the correction system (7.35MHz) (Not used)
17	MONIT	O	LSI internal monitoring signal output. DSP internal flag and PLL clock can be monitored by microcomputer commands (Not used)
18	VDD	—	+5V power supply
19	TESIO0	—	Test pin (Fixed at "L")
20	P2VREF	I	Reference voltage input for PLL (+4.2V)
21	SPDO	O	VCO center frequency shift signal output
22	PDOS	O	Outputs of phase error between EFM signal and PLCK signal (Used in x8 speed mode)
23	PDO	O	Outputs of phase error diference signal between EFM signal and PLCK signal
24	TMAXS	O	TMAX detection result signal output (Select by command bit TMPS) *1
25	TMAX	O	TMAX detection result signal output (Select by command bit TMPS)
26	LPFN	I	Inverted amplifier input for low-pass filter
27	LPFO	O	Amplifier output for low-pass filter
28	PVREF	I	Reference voltage input for PLL (+2.1V)
29	VCOREF	I	VCO center frequency reference level input (Fixed at "PVREF")
30	VCOF	O	Output from VCO filter
31	AVSS	—	Ground (Analog)
32	SLCO	O	Data slice level signal output
33	RFI	I	RF signal input
34	AVDD	—	+5V power supply (Analog)
35	RFCT	I	RFRP signal center level input
36	RFZI	I	RFRP zero crossing input
37	RFRP	I	RF ripple signal input
38	FEI	I	Focus error signal input
39	SBAD	I	Sub beam adding signal input
40	TSIN	I	Test pin (Fixed at "VREF")

*1

TMAX detection result	TMAX output
Longer than ref. period	P2VREF
Shorter than ref. period	VSS
Within ref. period	HiZ

Pin No.	Pin Name	I/O	Function
41	TEI	I	Tracking error signal input
42	TEZI	I	Tracking error zero crossing signal input
43	FOO	O	Focus servo equalizer signal output
44	TRO	O	Tracking servo equalizer signal output
45	VREF	I	Reference voltage input (+2.1V)
46	RFGC	O	RF amplitude control signal output. The three-value PWM signal is output (PWM carrier = 88.2kHz)
47	TEBC	O	Tracking balance control signal output. The three-value PWM signal is output (PWM carrier : 88.2kHz)
48	FMO	O	Feed motor equalizer signal output. The three-value PWM signal is output (PWM carrier : 88.2kHz)
49	FVO	O	Speed error signal or Field search EQ output. The three-value PWM signal is output (PWM carrier = 88.2kHz) (Not used)
50	DMO	O	Disc equalizer signal output. The three-value PWM signal is output (PWM carrier : 88.2kHz)
51	2VREF	I	Reference voltage input (+4.2V)
52	SEL	O	APC circuit ON/OFF signal output. "Hi-Z" is output when UHS = "L" at laser ON, or "H" is output when UHS = "H"
53	FLGA	O	External flag output for internal signal monitoring. TEZC, /FOON, /FOK or RFZC signal is selectable by command
54	FLGB	O	External flag output for internal signal monitoring. TRON, /FOON, /DMON or RFZC signal is selectable by command
55	FLGC	O	External flag output for internal signal monitoring. TRON, /TSSR, /FOK or /SRCH signal is selectable by command
56	FLGD	O	External flag output for internal signal monitoring. TRON, /DMON, /HYS or /SHC signal is selectable by command
57	VDD	—	+5V power supply
58	VSS	—	Ground
59	IO0	O	RF equalizer control signal output
60	XLOCK	I/O	PLL LOCK "L" PLL UNLOCK "H"
61	IO2	I/O	Not used
62	IO3	I/O	Not used
63	/DMOUT	I	This pins sets field equalizer binary PWM output mode from pins 100 and 101,ans also sets disc equalizer binary PWM output mode from pins 102 and 103 "L": active (Not used)
64	/CKSE	I	Crystal selection pin "H": 16.934MHz, "L": 33.8688MHz (Fixed at "L")
65	/DACT	I	Test pin (Not used)
66	/TESIN	I	Test pin (Fixed at "L")
67	TESIO1	I	Test pin (Fixed at "L")
68	VSS	—	Ground
69	PXI	I	DSP clock oscillating circuit input (50.8032MHz)
70	PXO	O	DSP clock oscillating circuit output (50.8032MHz)

Pin No.	Pin Name	I/O	Function
71	VDD	—	+5V power supply
72	/VSS	—	Ground
73	XI	I	Crystal oscillating circuit input (33.8688MHz)
74	XO	O	Crystal oscillating circuit output (33.8688MHz)
75	/VDD	—	+5V power supply
76	DVDD	—	+5V power supply (Digital)
77	RO	O	Forward audio R-ch data output
78	DVSS	—	Ground (Digital)
79	DVR	I	D/A converter reference voltage input
80	LO	O	Forward audio L-ch data output
81	DVDD	—	+5V power supply (Digital)
82	TEST1	I	Test pin (Not used)
83	TEST2	I	
84	TEST3	I	
85	BUS0	I/O	Data input/output with microcomputer interface
86	BUS1	I/O	
87	BUS2	I/O	
88	BUS3	I/O	
89	VDD	—	+5V power supply
90	VSS	—	Ground
91	BUCK	I	Clock input for microcomputer interface
92	/CCE	I	Chip enable input for microcomputer interface
93	TEST4	I	Test pin (Not used)
94	/TSMOD	I	Local test mode selection input (Not used)
95	/RST	I	Reset signal input “L”: reset
96	TEST0	I	Test pin (Not used)
97	/HSO	O	Play speed mode flag output *2 (Not used)
98	/UHSO	O	
99	EMPH	O	Emphasis flag output for subcode Q data “H”: emphasis ON (Not used)
100	LRCK	O	Channel clock output (44.1kHz) “L”: L-ch, “H”: R-ch

*2

/UHSO	/HSO	Play speed
H	H	x1 speed
H	L	x2 speed
L	H	x4 speed
L	L	x8 speed

• **IC202 CD-ROM Decoder & SCSI Interface (CXD1804AR) / MA-C22 board**

Pin No.	Pin Name	I/O	Function
1	VSS	—	Ground
2	VDD	—	+5V power supply
3	XDB0	I/O	SCSI data bus bit 0
4	VSS	—	Ground
5	XDB1	I/O	SCSI data bus bit 1
6	VSS	—	Ground
7	VDD	—	+5V power supply
8	XDB2	I/O	SCSI data bus bit 2
9	VSS	—	Ground
10	XDB3	I/O	SCSI data bus bit 3
11	XDB4	I/O	SCSI data bus bit 4
12	VSS	—	Ground
13	VSS	—	
14	VDD	—	+5V power supply
15	XDB5	I/O	SCSI data bus bit 5
16	VSS	—	Ground
17	NC	—	Not used
18	XDB6	I/O	SCSI data bus bit 6
19	VSS	—	Ground
20	XDB7	I/O	SCSI data bus bit 7
21	VSS	—	Ground
22	VDD	—	+5V power supply
23	XDBP	I/O	SCSI data bus parity
24	VSS	—	Ground
25	NC	—	Not used
26	XATN	I/O	XATN signal input/output with SCSI control bus
27	VSS	—	Ground
28	XBSY	I/O	XBSY signal input/output with SCSI control bus
29	VSS	—	Ground
30	VDD	—	+5V power supply
31	XACK	I/O	XACK signal input/output with SCSI control bus
32	XRST	I/O	XRST signal input/output with SCSI control bus
33	VDD	—	+5V power supply
34	VSS	—	Ground
35	NC	—	Not used
36	NC	—	Not used
37	VDD	—	+5V power supply
38	VSS	—	Ground
39	XMSG	I/O	XMSG signal input/output with SCSI control bus
40	XSEL	I/O	XSEL signal input/output with SCSI control bus

Pin No.	Pin Name	I/O	Function
41	VSS	—	Ground
42	VDD	—	+5V power supply
43	XCD	I/O	XCD signal input/output with SCSI control bus
44	VSS	—	Ground
45	XREQ	I/O	XREQ signal input/output with SCSI control bus
46	VSS	—	Ground
47	XIO	I/O	XIO signal input/output with SCSI control bus
48	VSS	—	Ground
49	VDD	—	+5V power supply
50	XRES	I	Reset input “L”: reset
51	MA0	O	Address output to buffer memory
52	MA1	O	
53	MA2	O	
54	MA3	O	
55	MA4	O	
56	MA5	O	
57	MA6	O	
58	VSS	—	Ground
59	MA7	O	Address output to buffer memory
60	MA8	O	
61	MA9	O	Address output to buffer memory (Not used)
62	XRAS	O	RAS signal output to Buffer memory
63	XUCAS	O	Upper byte CAS signal output to Buffer memory
64	XLCAS	O	Lower byte CAS signal output to Buffer memory
65	XMWR	O	Data write strobe signal output to Buffer memory
66	VSS	—	Ground
67	VDD	—	+5V power supply
68	MDB0	I/O	Data bus input/output with Buffer memory
69	MDB1	I/O	
70	MDB2	I/O	
71	MDB3	I/O	
72	MDB4	I/O	
73	MDB5	I/O	
74	MDB6	I/O	
75	MDB7	I/O	
76	VSS	—	Ground
77	MDB8	I/O	Data bus input/output with Buffer memory
78	MDB9	I/O	
79	MDB10	I/O	
80	MDB11	I/O	

Pin No.	Pin Name	I/O	Function
81	MDB12	I/O	Data bus input/output with Buffer memory
82	MDB13	I/O	
83	MDB14	I/O	
84	MDB15	I/O	
85	VSS	—	Ground
86	VDD	—	+5V power supply
87	EXCK	O	Clock for SIBN reading output to digital servo and digital signal prosesor
88	SBIN	I	Subcode serial signal input from digital servo and digital signal prosesor
89	SCOR	I	Subcode sync signal input from digital servo and digital signal prosesor
90	WFCK	I	Write frame clock input from digital servo and digital signal prosesor
91	C2PO	I	C2PO indicates that there is an error in C2 pointer signal MDAT.
92	BCLK	I	Bit clock for MDAT strobe signal input from digital servo and digital signal prosesor
93	MDAT	I	Serial data stream input from digital servo and digital signal prosesor
94	LRCK	I	LR clock input from digital servo and digital signal prosesor
95	VSS	—	Ground
96	SQSO	O	Sub-Q sync signal output (Not used)
97	SQCK	O	Sub-Q sync clock output (Not used)
98	DATO	O	Serial data output to sub CPU to CD DSP (Not used)
99	XLAT	O	DATO latch signal output (Latch at a rising edge) (Not used)
100	DSTB	O	Clock output for DATO transfer (Not used)
101	VSS	—	Ground
102	VDD	—	+5V power supply
103	TEST0	I	Test pin (Connected to Ground)
104	TEST1	I	
105	TEST2	I	
106	TEST3	I	
107	TEST4	I	
108	TEST5	I	
109	TEST6	I	
110	TEST7	I	
111	VSS	—	Ground
112	TEST8	I	Test pin (Connected to Ground)
113	TEST9	I	
114	TEST10	I	
115	TEST11	I	
116	TEST12	I	
117	VSS	—	Ground
118	VDD	—	+5V power supply
119	XTL2	O	Crystal oscillating circuit output terminal (40MHz)
120	XTL1	I	Crystal oscillating circuit input terminal (40MHz)

Pin No.	Pin Name	I/O	Function
121	CLK	I	Clock output (Not used)
122	XWAT	I	Access wait signal input from sub CPU buffer memory
123	A0	I	Address bus input for built-in register
124	A1	I	
125	A2	I	
126	A3	I	
127	A4	I	
128	A5	I	
129	A6	I	
130	VSS	—	Ground
131	D0	I/O	Data bus input/output with sub CPU
132	D1	I/O	
133	D2	I/O	
134	D3	I/O	
135	D4	I/O	
136	D5	I/O	
137	D6	I/O	
138	D7	I/O	
139	NC	—	Not used
140	VDD	—	+5V power supply
141	INT	O	Interrupt request signal output to CPU
142	XCS	I	Chip select signal input
143	XWR	I	Built-in register writing strobe signal input from CPU
144	XRD	I	Built-in register out strobe signal input from CPU

• **IC205 Gate Array (BU6243K) / MA-C22 board**

Pin No.	Pin Name	I/O	Function
1	ID1	I	Assigns the driver's SCSI ID. Select an ID number.
2	ID2	I	Which is not used by other SCSI devices conncted to the bus
3	MODE0	I	Not used
4	P/A	I	Chucking Action Prevent/Allow = H/L
5	TEST	I	Test pin
6	CNTRST	O	Reset output to digital servo and digital signal processor
7	PRSTB	O	Reset output to CD-ROM decoder, SCSI interface and micro computer
8	VAIN	I	+5V power supply (Analog)
9	RSTB	I/O	Not used
10	TESTIN	I	Not used
11	RAMCS	O	Not used
12	CXDCS	O	Chip select signal output to CD-ROM decoder, SCSI interface and micro computer
13	PWM0	O	Not used
14	F10M	O	Clock output (10MHz)
15	CNT20M	O	Not used
16	F20M	O	Clock output to micro computer (20MHz)
17	GND	—	Ground
18	XTAL1	I	Oscillation cel input (20MHz)
19	XTAL2	O	Oscillation cel output (20MHz)
20	DEOUT	O	Not used
21	WR	I	Write strobe signal input from micro computer
22	RD	I	Read strobe signal input from micro computer
23	A0	I	Addres bus input
24	A1	I	
25	A2	I	
26	A17	I	
27	A18	I	
28	A19	I	
29	GND	—	Ground
30	D0	I/O	Data bus input/output
31	D1	I/O	
32	D2	I/O	
33	D3	I/O	
34	RFD0	O	RF equalizer switch control signal output
35	RFD1	O	
36	XBUSY	O	BUSY LED drive signal output
37	TRGSL	O	Tracking filter switch control signal output
38	XHMUTE	O	Audio mute signal output
39	VDD	O	+5V power supply
40	CONSTSL	O	Spindle switch control signal output
41	XTIN	O	Chucking motor control signal output
42	XTOUT	O	
43	PARITY	I	Enables/Disables the SCSI bus parity check function
44	ID0	I	Assigns the driver's SCSI ID. Select an ID number. Which is not used by other SCSI devices conncted to the bus

• **IC401 Sled Driver (LA6527N) / MA-C22 board**

Pin No.	Pin Name	I/O	Function
1	VCC2	—	+12V power supply
2	MTR+	O	Power amplifier MTR+ output
3	GND	—	Ground
4	GND	—	Ground
5	MTR-	O	Power amplifier MTR- output
6	VC	I	Buffer VC input
7	DVO	O	DV amplifier DVO output (Not used)
8	DV-	I	DV amplifier DV- input (Not used)
9	DV+	I	DV amplifier DV+ input (Not used)
10	ERO	O	ER amplifier ERO output
11	ER-	I	ER amplifier ER- input
12	DVI	I	ER amplifier DVI input
13	VLO	O	VL amplifier VLO output (Not used)
14	CB-	I	2 to 4 decoder CB- input (Not used)
15	CB+	I	2 to 4 decoder CB+ input (Not used)
16	CA-	I	2 to 4 decoder CA- input (Not used)
17	CA+	I	2 to 4 decoder CA+ input (Not used)
18	TKC	O	Edge detect TKC output (Not used)
19	VL-	I	VL amplifier VL- input (Not used)
20	GND	—	Ground
21	GND	—	Ground
22	VH-	O	Hall bias circuit VH- output (Not used)
23	VH+	O	Hall bias circuit VH+ output (Not used)
24	VCC1	—	+5V power supply
25	CTRL	I	Hall bias circuit CTRL input (Not used)
26	BYPS	O	Buffer BYPS output
27	B-	O	Hall amplifier B- output (Not used)
28	B+	O	Hall amplifier B+ output (Not used)
29	HB-	I	Hall amplifier B HB- input (Not used)
30	HB+	I	Hall amplifier B HB+ input (Not used)
31	A-	O	Inverter, buffer A A- output (Not used)
32	A+	O	Inverter, buffer A A+ output (Not used)
33	HA-	I	Hall amplifier A HA- input (Not used)
34	HA+	I	Hall amplifier A HA+ input (Not used)

- **IC402 Spindle Driver (LB1916) / MA-C22 board**

Pin No.	Pin Name	I/O	Function
1	WIN1	I	W phase hall element input
2	WIN2	I	
3	GND	—	Ground
4	GND	—	
5	FC	O	Prevents to oscillate by lowering frequency characteristic of input/output gain with capacitor connection between FC and Ground terminals
6	S/S	I	Start/stop control signal input "H": start , "L": stop
7	NC	—	Not used
8	CTRL1	I	Operation mode switching input
9	CTRL2	I	
10	GC2	I	Input/output gain switching input
11	GC1	I	
12	VCREF	I	Decides motor control stop voltage input (+2.1V)
13	VC	I	Speed control signal input
14	Z2	I	Connected to gain setting resistor of first stage amp
15	Z1	I	
16	VCC2	—	+5V power supply
17	RF	O	Ground of output transistor. Resistor insertion between RF and ground terminals realizes to defect output current as voltage value, so over current to defect output current as voltage value, so over current protection is posibble
18	NC	—	Not used
19	WOUT	O	W phase signal output
20	GND	—	Ground
21	GND	—	Ground
22	VOUT	O	V phase signal output
23	UOUT	O	U phase signal output
24	NC	—	Not used
25	VCC1	—	+12V power supply
26	CL	I	When RF terminal is equal to CL voltage, current limmiter works
27	HFG1	O	Hall FG signal output
28	HFG2	O	
29	VH-	—	Hall element power supply terminal
30	VH+	—	
31	UIN1	I	U phase hall element input
32	UIN2	I	
33	VIN1	I	V phase hall element input
34	VIN2	I	

• **IC701 Mecha. Control (HD6413002F) / Main board**

Pin No.	Pin Name	I/O	Function
1	VCC	—	+5V power supply
2	PB0	I/O	Input/output with data bus for LCD
3	PB1	I/O	
4	PB2	I/O	
5	PB3	I/O	
6	PB4	I/O	
7	PB5	I/O	
8	PB6/DREQ0	I/O	
9	PB7/DREQ1	I/O	
10	XRES0	O	Reset output
11	VSS	—	Ground
12	TXD0	O	Serial transmit data output to RS-232C
13	TXD1	O	Not used
14	RXD0	I	Serial reception data input from RS-232C
15	RXD1	I	Not used
16	SCK0	O	
17	SCK1	O	
18	D0	I/O	Input/output with data bus
19	D1	I/O	
20	D2	I/O	
21	D3	I/O	
22	VSS	—	Ground
23	D4	I/O	Input/output with data bus
24	D5	I/O	
25	D6	I/O	
26	D7	I/O	
27	D8	I/O	
28	D9	I/O	
29	D10	I/O	
30	D11	I/O	
31	D12	I/O	
32	D13	I/O	
33	D14	I/O	
34	D15	I/O	
35	VCC	—	+5V power supply
36	A0	O	Output to address bus
37	A1	O	
38	A2	O	
39	A3	O	
40	A4	O	

Pin No.	Pin Name	I/O	Function
41	A5	O	Output to address bus
42	A6	O	
43	A7	O	
44	VSS	—	Ground
45	A8	O	Output to address bus
46	A9	O	
47	A10	O	
48	A11	O	
49	A12	O	
50	A13	O	
51	A14	O	
52	A15	O	
53	A16	O	
54	A17	O	
55	A18	O	
56	A19	O	
57	VSS	—	Ground
58	P60/XWAIT	I/O	Serial data input/output with EEPROM interface
59	P61/XBREQ	O	Serial clock output to EEPROM interface
60	P62/XBACK	O	Not used
61	SYSCLK	O	System clock output (Not used)
62	XSTBY	I	Standby signal input (Connected to +5V)
63	XRES	I	Reset input
64	NMI	I	Non-maskable interrupt input
65	VSS	—	Ground
66	EXTAL	I	External clock input (9.8304MHz)
67	XTAL	O	Not used
68	VCC	—	+5V power supply
69	XAS	O	Address strobe output (Not used)
70	XRD	O	Read signal output
71	XHWR	O	Higher byte write strobe signal output
72	XLWR	O	Lower byte write strobe signal output
73	MD0	I	Operation mode setting terminal
74	MD1	I	
75	MD2	I	
76	AVCC	—	+5V power supply (Internal A/D converter)
77	VREF	I	Reference voltage input to internal A/D converter (+5V)
78	P70/AN0	I	Key input (Analog)
79	P71/AN1	I	
80	P72/AN2	I	

Pin No.	Pin Name	I/O	Function
81	P73/AN3	I	Key input (Analog)
82	P74/AN4	I	Analog input for ID SELECTOR (CD-ROM drive A)
83	P75/AN5	I	Analog input for ID SELECTOR (CD-ROM drive B)
84	P76/AN6/DA0	I	Analog input for battery voltage (+2.5V)
85	P77/AN7/DA1	O	Not used
86	AVSS	—	Ground
87	P80/XIRQ0	O	Not used
88	P81/XIRQ1/XCS3	I	Carrier reset position detection input
89	P82/XIRQ2/XCS2	I	SCSI controller interrupt input
90	P83/XIRQ3/XCS1	O	Chip select output (Not used)
91	P84/XCS0	O	
92	VSS	—	Ground
93	PA0/TEND0	I	FG pulse input
94	PA1/TEND1	I	
95	PA2	O	Elevator motor drive clock signal output
96	PA3	O	Elevator motor drive direction signal output
97	PA4	O	Elevator motor drive enable signal output
98	PA5	O	Enable signal output for LCD
99	PA6	O	Read/write signal output for LCD
100	PA7	O	Register select signal output for LCD

• **IC702 I/O Expander (CXD1095Q) / Main board**

Pin No.	Pin Name	I/O	Function
1	NC	—	Not used
2	NC	—	
3	PB1	I	Clip release position detection input
4	PB2	I	Clip return position detection input
5	PB3	I	Clip home position detection input
6	PB4	I	Clip hold position detection input
7	PB5	I	Clip empty position detection input
8	PB6	I	Detection input from mailbox disc sensor
9	PB7	I	Not used
10	VSS	—	Ground
11	PC0	I	Unchucking detection input of CD-ROM drive A
12	PC1	I	Chucking detection input of CD-ROM drive A
13	PC2	I	Unchucking detection input of CD-ROM drive B
14	PC3	I	Chucking detection input of CD-ROM drive B
15	PC4	I	Connection detect input of CD-ROM drive A
16	PC5	I	Connection detect input of CD-ROM drive B
17	PC6	I	Detection input from mailbox tray loading out switch
18	PC7	I	Detection input from mailbox tray loading in switch
19	NC	—	Not used
20	PD0	O	Chucking switch signal output of CD-ROM drive A
21	PD1	O	Chucking switch signal output of CD-ROM drive B
22	PD2	O	Mailbox tray motor control signal output (In direction)
23	PD3	O	Mailbox tray motor control signal output (Out direction)
24	PD4	O	Clip motor control signal output (Forward)
25	VSS	—	Ground
26	VDD	—	+5V power supply
27	PD5	O	Clip motor control signal output (Reverse)
28	PD6	O	Not used
29	PD7	O	
30	D0	I/O	Input/output with data bus
31	D1	I/O	
32	D2	I/O	
33	NC	—	Not used
34	NC	—	
35	D3	I/O	Input/output with data bus
36	D4	I/O	
37	D5	I/O	
38	D6	I/O	
39	D7	I/O	
40	XCLR	I	Clear signal input

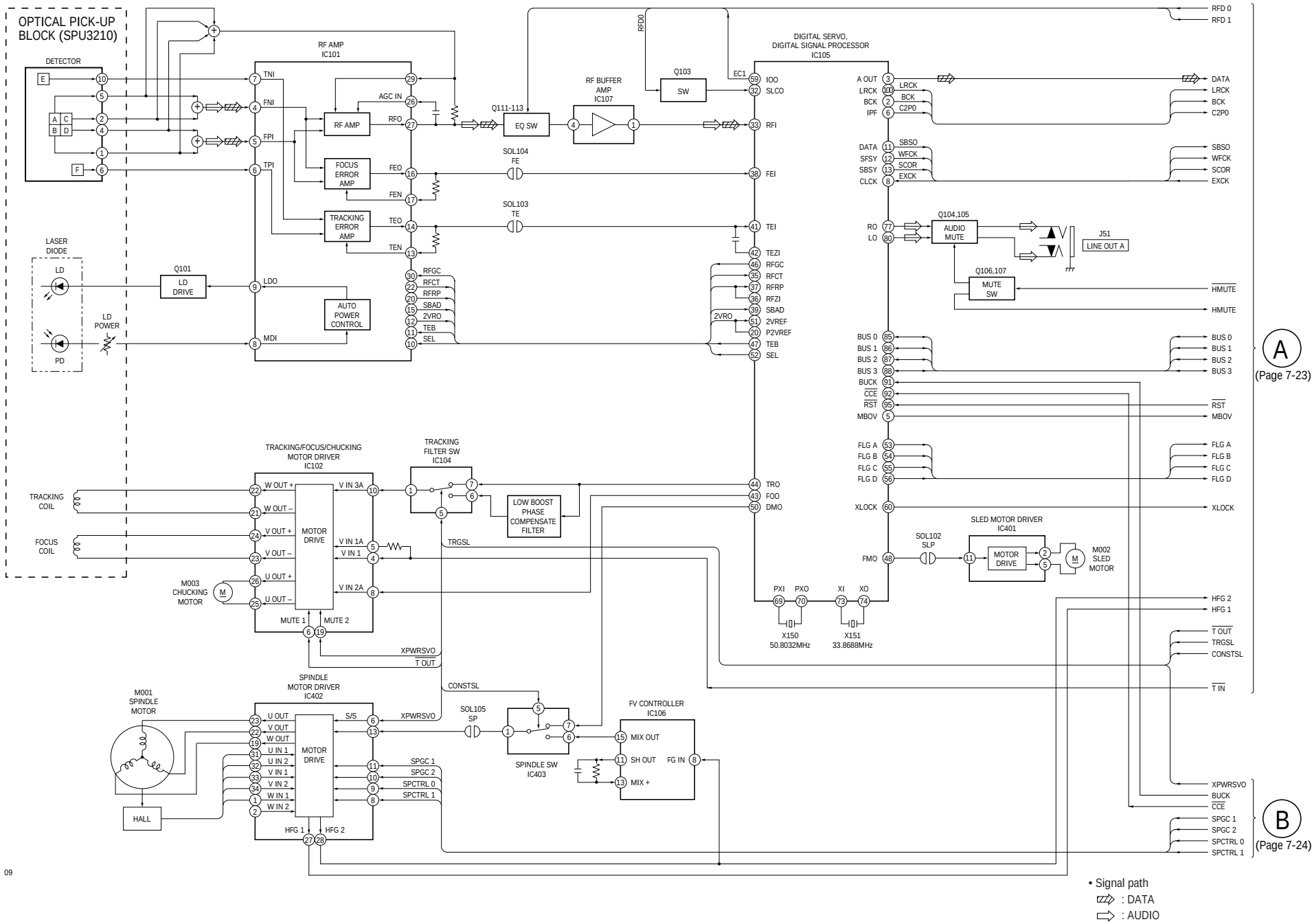
Pin No.	Pin Name	I/O	Function
41	XRST	I	Reset input
42	VSS	—	Ground
43	XWR	I	Write signal input
44	XRD	I	Read signal input
45	XCS	I	Chip select signal input
46	A0	I	Input from address bus
47	A1	I	
48	A2	I	
49	PX0	O	POWER LED drive signal output
50	PX1	O	
51	NC	—	Not used
52	PX2	O	
53	PX3	O	
54	PA0	I	Mode switch input
55	PA1	I	
56	PA2	I	
57	VSS	—	Ground
58	VDD	—	+5V power supply
59	PA3	I	Mode switch input
60	PA4	I	
61	PA5	I	
62	PA6	I	
63	PA7	I	
64	PB0	I	Detection input from clip disc sensor

• **IC708 SCSI Controller (FAS204) / Main board**

Pin No.	Pin Name	I/O	Function
1	PAD5	I/O	Data bus input/output
2	PAD6	I/O	
3	PAD7	I/O	
4	VDD	—	+5V power supply
5	NC	—	Not used
6	VSS	—	Ground
7	XSD0	I/O	SCSI data bus input/output
8	XSD1	I/O	
9	XSD2	I/O	
10	XSD3	I/O	
11	VSS	—	Ground
12	XSD4	I/O	SCSI data bus input/output
13	XSD5	I/O	
14	XSD6	I/O	
15	XSD7	I/O	
16	XSDP	I/O	SCSI data parity signal input/output
17	NC	—	Not used
18	VSS	—	Ground
19	XSEL	I/O	SCSI bus select signal input/output
20	XBSY	I/O	SCSI bus busy signal input/output
21	XREQ	I/O	SCSI bus request signal input/output
22	XACK	I/O	SCSI bus acknowledge signal input/output
23	VSS	—	Ground
24	XMSG	I/O	SCSI bus message phase signal input/output
25	XCD	I/O	SCSI bus control/data phase signal input/output
26	XIO	I/O	SCSI bus I/O phase signal input/output
27	XATN	I/O	SCSI bus attention signal input/output
28	XRST	I/O	SCSI bus reset signal input/output
29	VSS	—	Ground
30	MODE	I	Bus configuration mode select signal input
31	XINT	O	Microprocessor interrupt signal output
32	XRESET	I	Chip reset signal input
33	NC	—	Not used
34	XWR	I	Write control signal input
35	XRD	I	Read control signal input
36	XCS	I	Chip select signal input
37	A0	I	Address input for Register
38	A1	I	
39	A2	I	
40	A3	I	

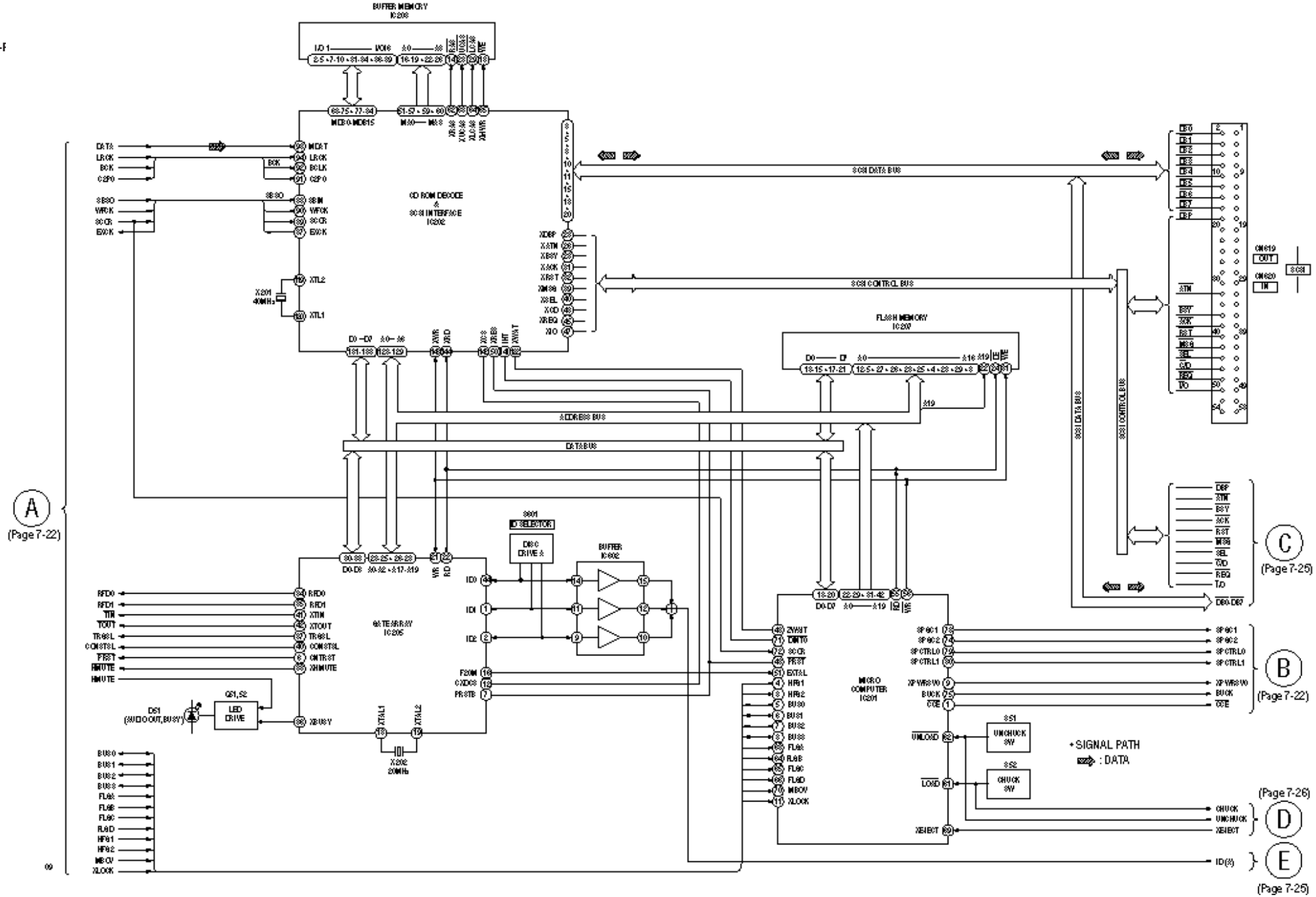
Pin No.	Pin Name	I/O	Function
41	CK	I	Clock input (19.6608MHz)
42	VDD	—	+5V power supply
43	VSS	—	Ground
44	DREQ	O	DMA request signal output
45	NC	—	Not used
46	XDACK	I	DMA acknowledge signal input (Not used)
47	XDBWR	I	DMA data bus write signal input (Not used)
48	NC	—	Not used
49	VSS	—	Ground
50	DB0	I/O	DMA data bus input/output (Not used)
51	DB1	I/O	
52	DB2	I/O	
53	DB3	I/O	
54	DB4	I/O	
55	DB5	I/O	
56	DB6	I/O	
57	DB7	I/O	
58	DBP0	I/O	DMA data bus parity signal input/output (Not used)
59	VSS	—	Ground
60	PAD0	I/O	Data bus input/output
61	PAD1	I/O	
62	PAD2	I/O	
63	PAD3	I/O	
64	PAD4	I/O	

7-3. BLOCK DIAGRAMS
— CD-ROM DRIVE (CDM-47)(1/2) SECTION —

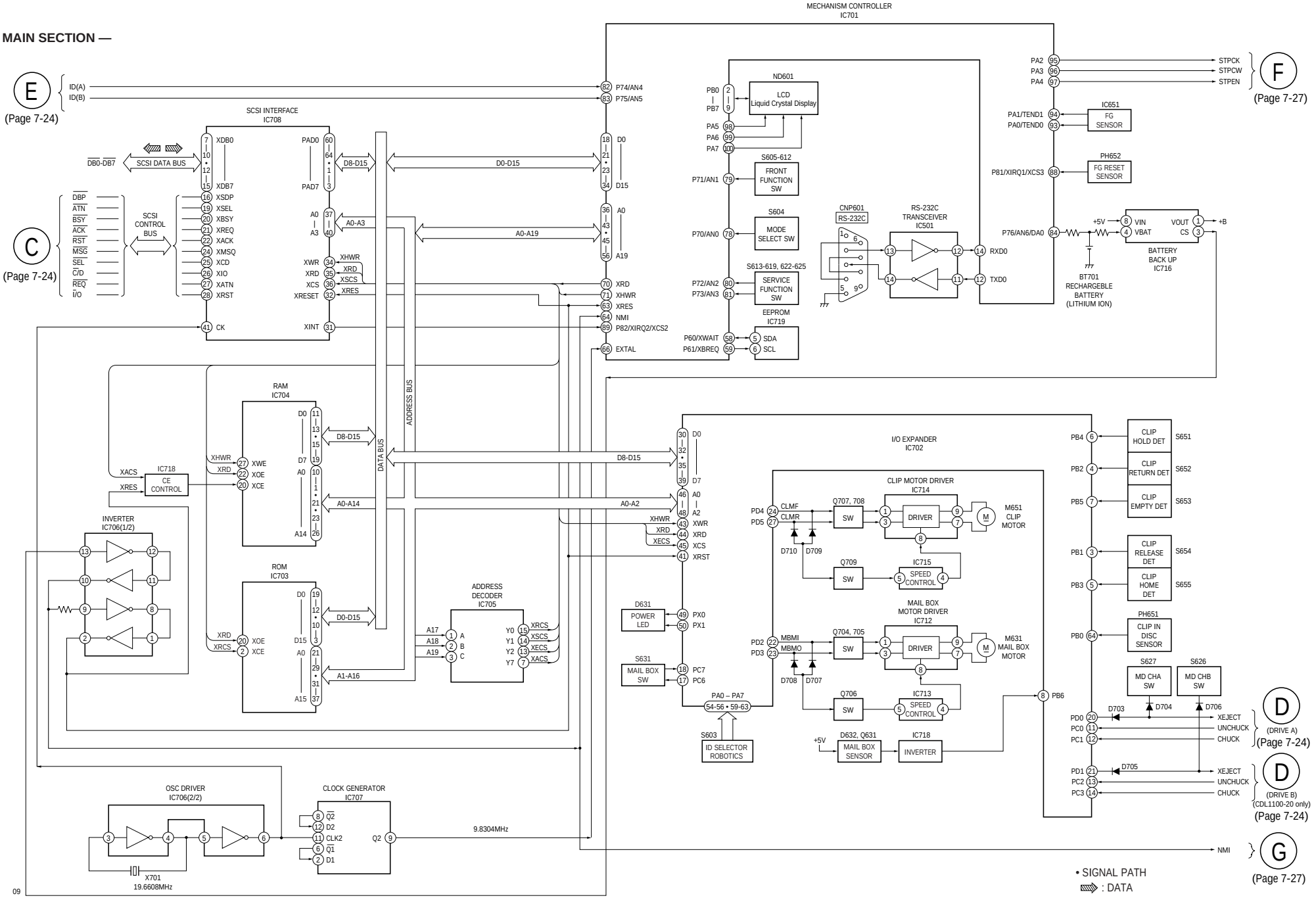


09

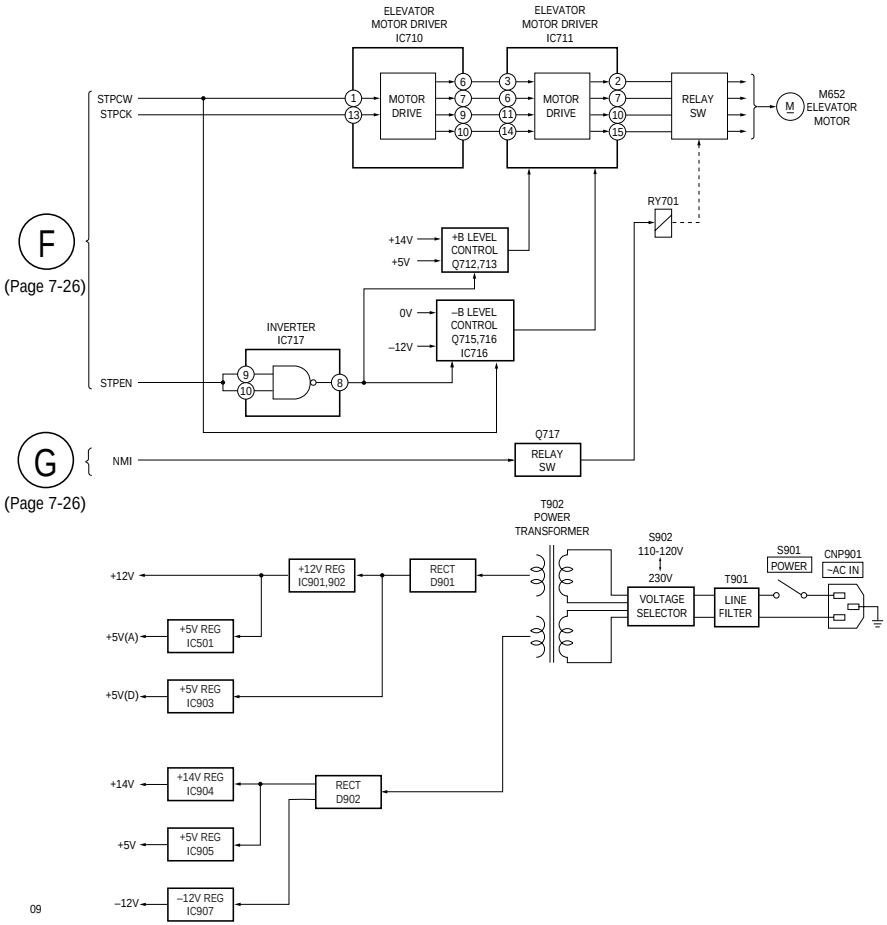
— CD-F


BUFFER MEMORY
IC208
CD ROM DECODE
&
SCSI INTERFACE
IC202
SCSI DATA BUS
SCSI CONTROL BUS
FLASH MEMORY
IC207
ADDRESS BUS
DATA BUS
SCSI DATA BUS
SCSI CONTROL BUS
SW1
ID SELECTOR
DISC DRIVE A
BUFFER
IC602
GATE ARRAY
IC205
LED DRIVE
DS1
(SWDIOOUT,BUSY)
S1,S2
MICRO COMPUTER
IC201
UNCHUCK SW
CHUCK SW
+SIGNAL PATH
: DATA
A
(Page 7-22)
B
(Page 7-22)
C
(Page 7-25)
D
(Page 7-26)
E
(Page 7-25)

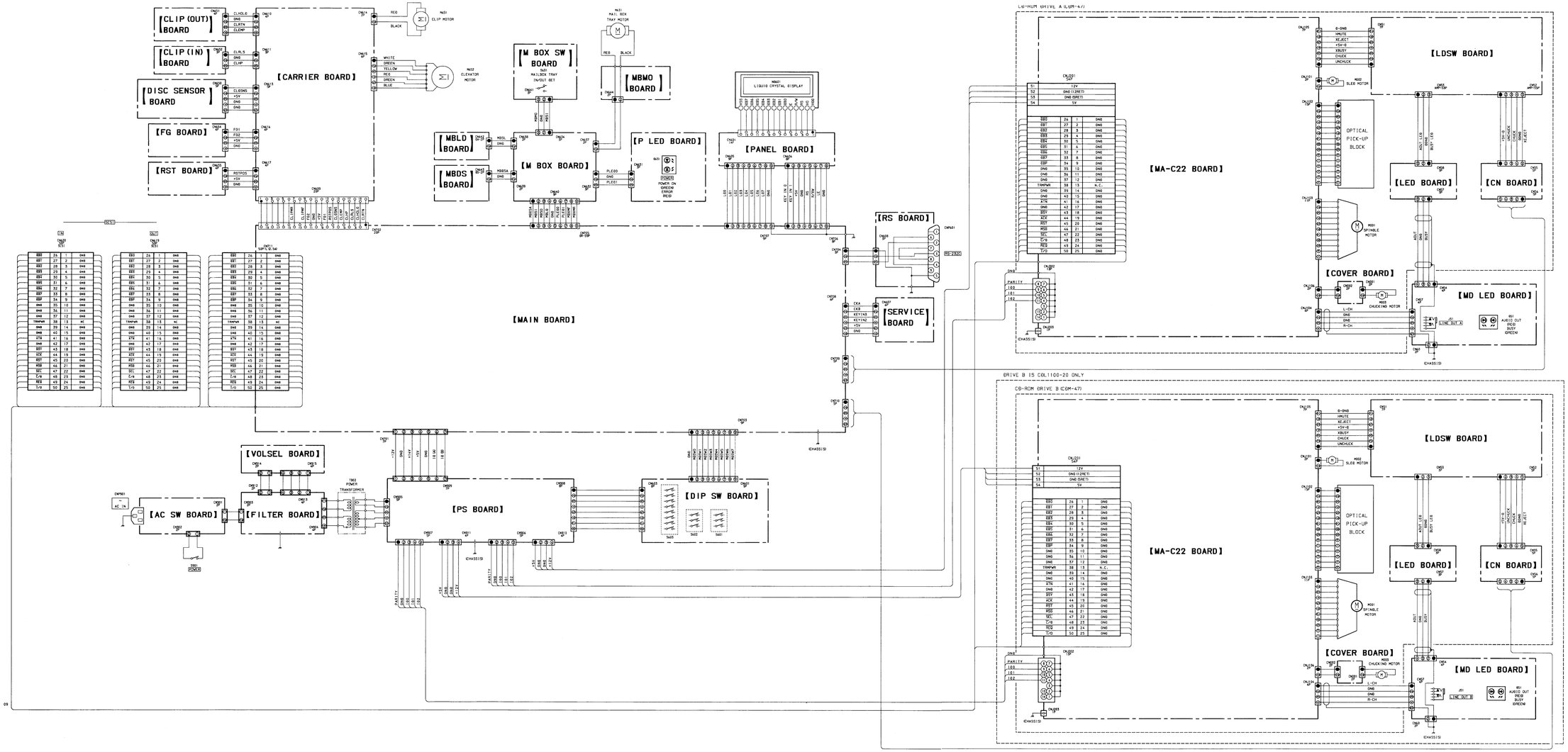
— MAIN SECTION —



— POWER SUPPLY SECTION —



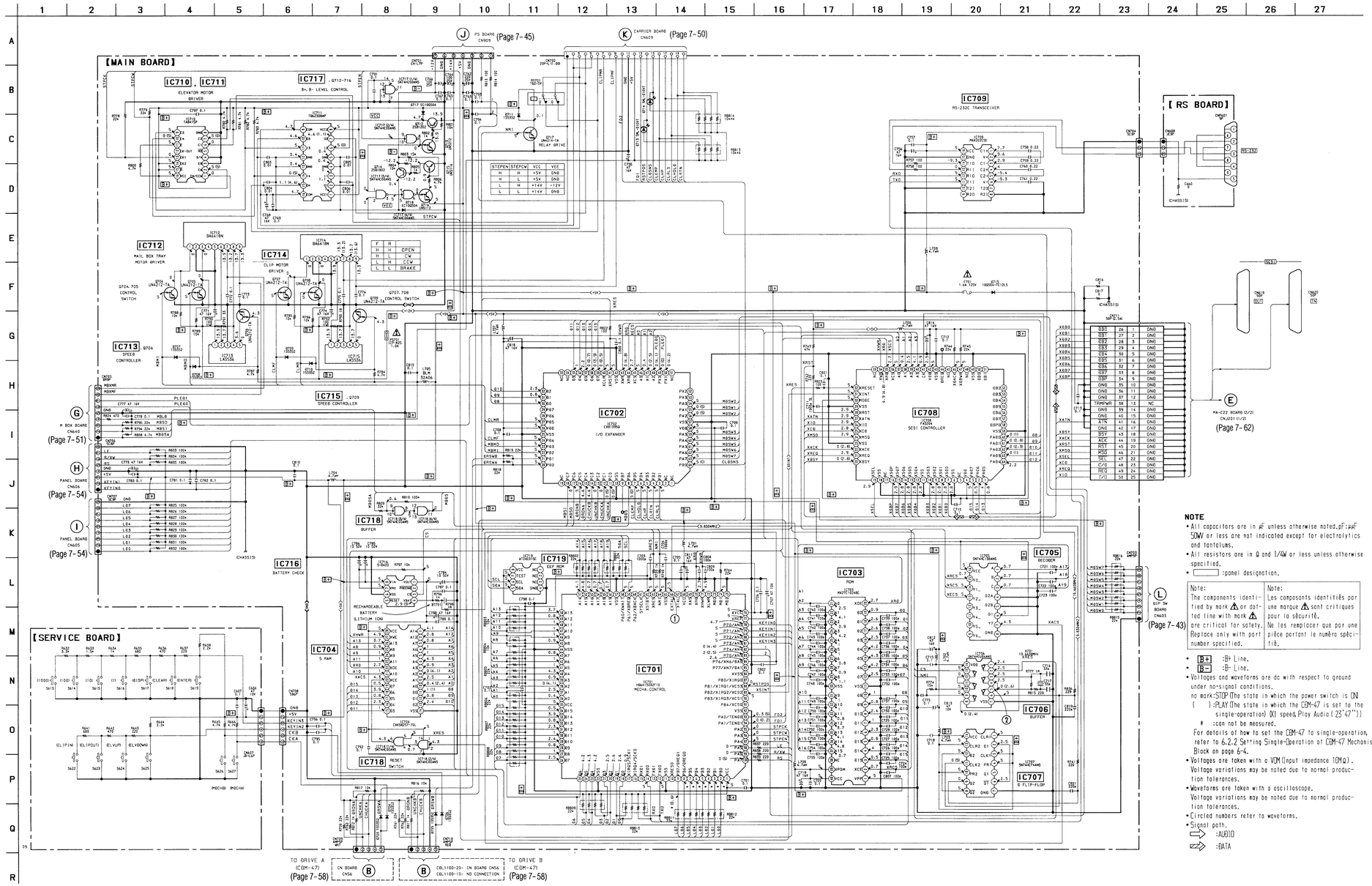
7-4. FRAME SCHEMATIC DIAGRAM



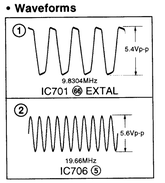
7-5. PRINTED WIRING BOARD/SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM — MAIN SECTION —

- See page 7-67 for IC Block Diagrams.
- See page 7-14 for IC Pin Functions.



• Waveforms



NOTE

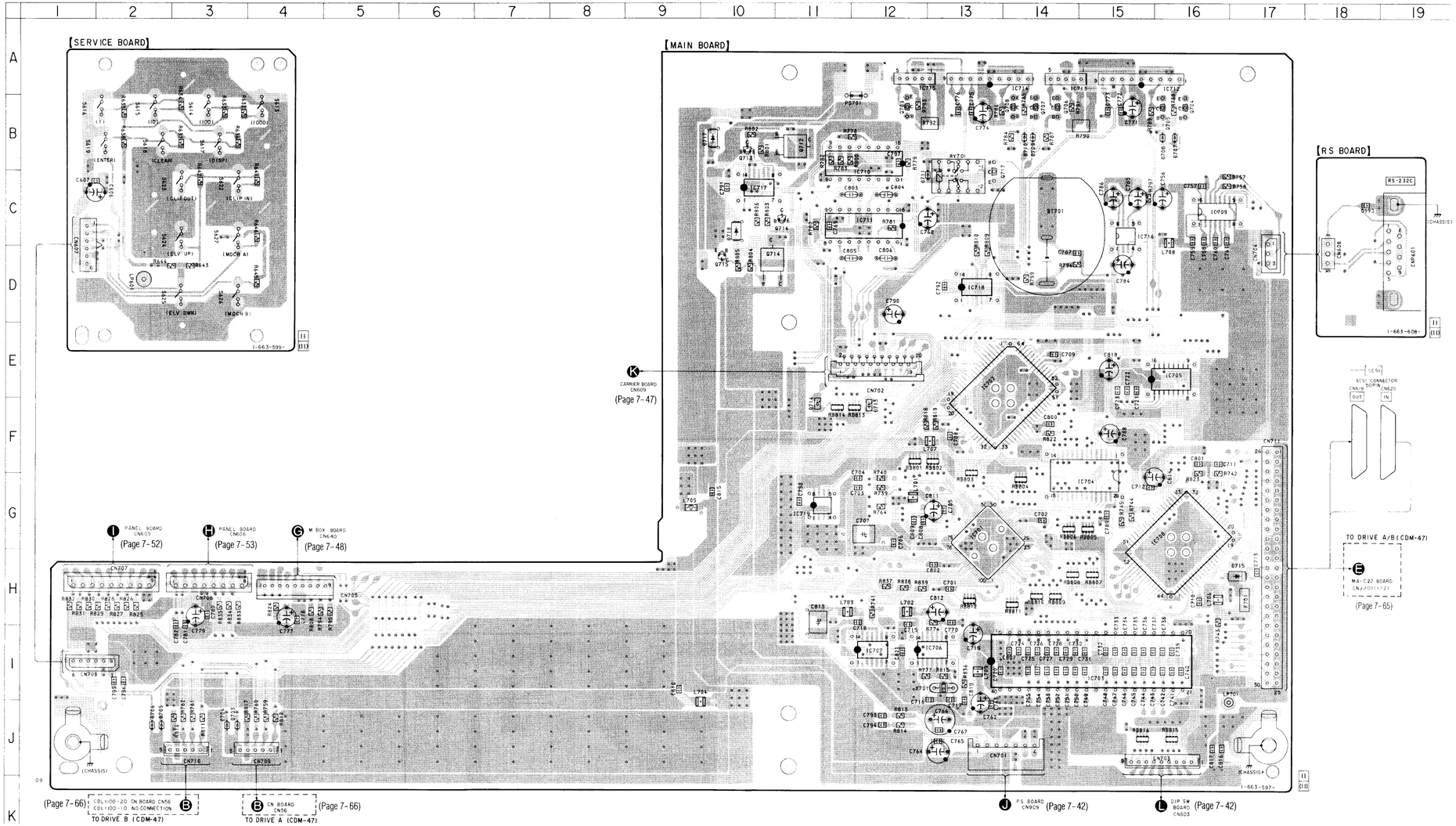
- All capacitors are in μF unless otherwise noted. pF: μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- [ ] : panel designation.

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- B+ : B+ Line.
- B- : B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: STOP (The state in which the power switch is ON
  ( ) : PLAY (The state in which the CDM-47 is set to the single-operation) (X1 speed, Play Audio (25'47''))
  * : can not be measured.
  For details of how to set the CDM-47 to single-operation, refer to 6-2-2 Setting Single-Operation of CDM-47 Mechanism Block on page 6-4.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : AUDIO
  ⇨ : DATA

PRINTED WIRING BOARD — MAIN SECTION —

• See page 7-1 for Circuit Boards Location.


【SERVICE BOARD】
【MAIN BOARD】
【RS BOARD】
CARRIER BOARD CN609 (Page 7-47)
PANEL BOARD CN605 (Page 7-52)
PANEL BOARD CN606 (Page 7-53)
M BOX BOARD CN640 (Page 7-48)
TO DRIVE A/B (CDM-47)
MA-C22 BOARD CNJ201/J21 (Page 7-65)
(Page 7-66)
CDL1100-20 ON BOARD CN56
CDL1100-10 NO CONNECTION
TO DRIVE B (CDM-47)
ON BOARD CN56 (Page 7-66)
TO DRIVE A (CDM-47)
PS BOARD CN909 (Page 7-42)
DIP SW BOARD CN603 (Page 7-42)

• **Semiconductor Location**

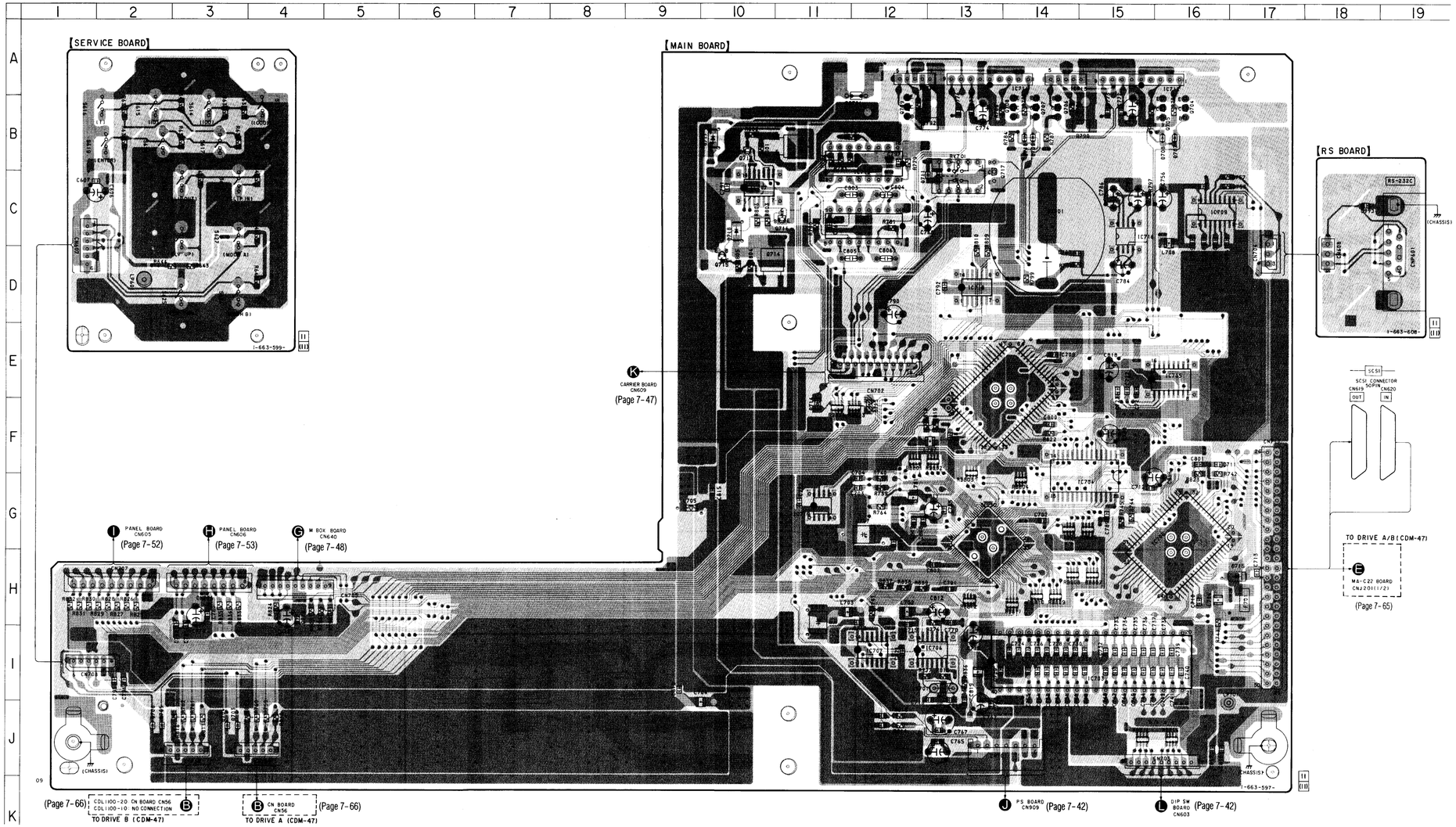
Ref. No.	Location
D703	J-3
D704	J-3
D705	J-2
D706	J-2
D707	B-16
D708	B-16
D709	B-14
D710	B-14
D711	B-13
D713	F-12
D714	F-11
D715	H-17
D717	B-10
D718	C-10
IC701	G-13
IC702	E-13
IC703	I-15
IC704	F-15
IC705	E-16
IC706	I-13
IC707	I-12
IC708	G-16
IC709	C-16
IC710	B-12
IC711	C-12
IC712	A-15
IC713	A-14
IC714	A-13
IC715	A-12
IC716	C-15
IC717	C-10
IC718	D-13
IC719	G-11
Q704	B-16
Q705	B-16
Q706	B-14
Q707	B-14
Q708	B-14
Q709	B-12
Q712	B-11
Q713	B-10
Q714	D-10
Q715	D-10
Q716	C-11
Q717	B-13

Note:

- ⟜ : parts extracted from the component side.
- ○ : Through hole.
- ▨ : Pattern from the side which enable seeing.

PRINTED WIRING BOARD — MAIN SECTION —

• See page 7-1 for Circuit Boards Location.



• **Semiconductor Location**

Ref. No.	Location
D703	J-3
D704	J-3
D705	J-2
D706	J-2
D707	B-16
D708	B-16
D709	B-14
D710	B-14
D711	B-13
D713	F-12
D714	F-11
D715	H-17
D717	B-10
D718	C-10
IC701	G-13
IC702	E-13
IC703	I-15
IC704	F-15
IC705	E-16
IC706	I-13
IC707	I-12
IC708	G-16
IC709	C-16
IC710	B-12
IC711	C-12
IC712	A-15
IC713	A-14
IC714	A-13
IC715	A-12
IC716	C-15
IC717	C-10
IC718	D-13
IC719	G-11
Q704	B-16
Q705	B-16
Q706	B-14
Q707	B-14
Q708	B-14
Q709	B-12
Q712	B-11
Q713	B-10
Q714	D-10
Q715	D-10
Q716	C-11
Q717	B-13

Note:

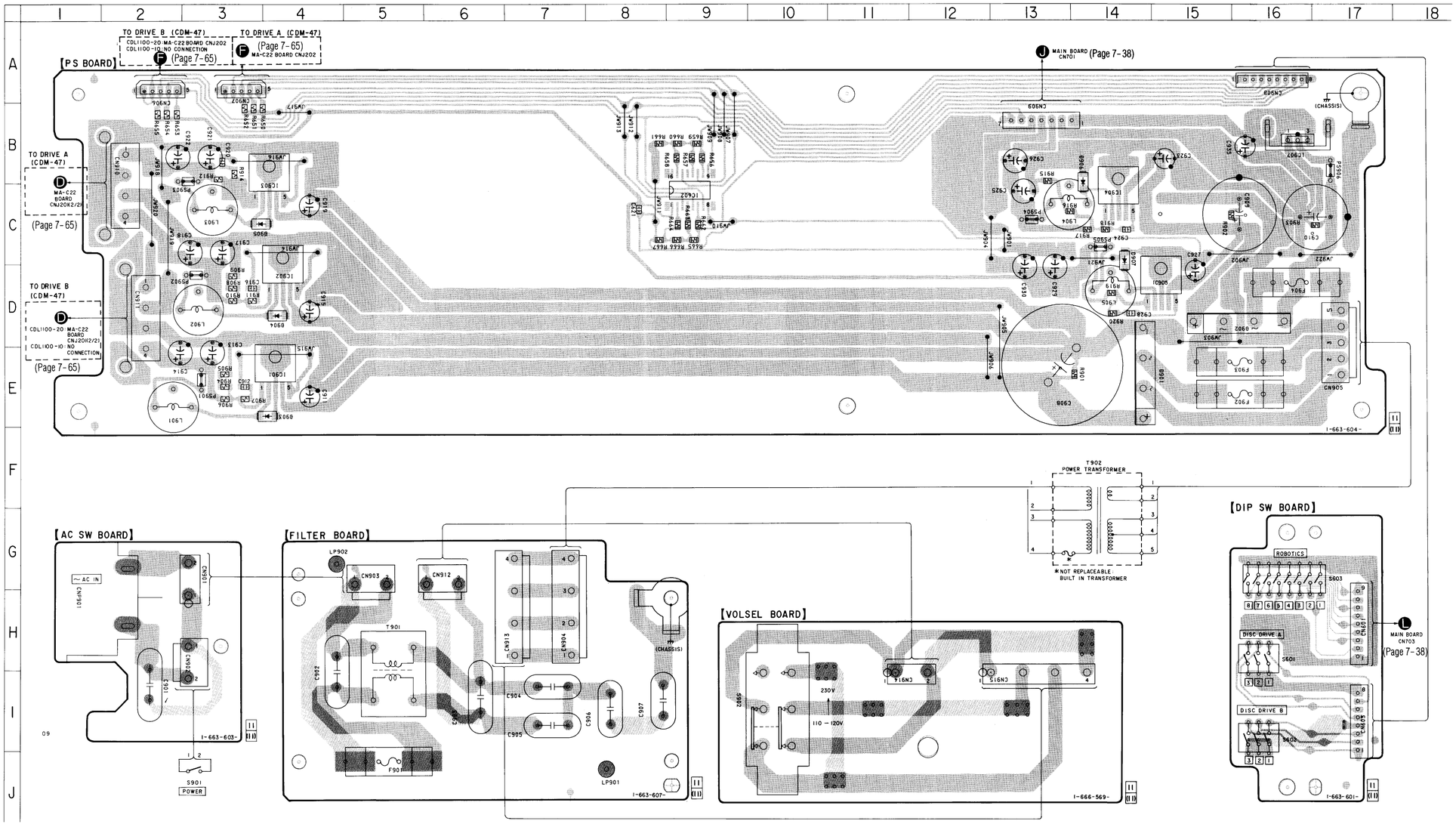
- ○—— : parts extracted from the component side.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enable seeing.
- ▒▒▒ : Pattern of the rear side.

PRINTED WIRING BOARD — POWER SUPPLY SECTION —

• See page 7-1 for Circuit Boards Location.

• **Semiconductor Location**

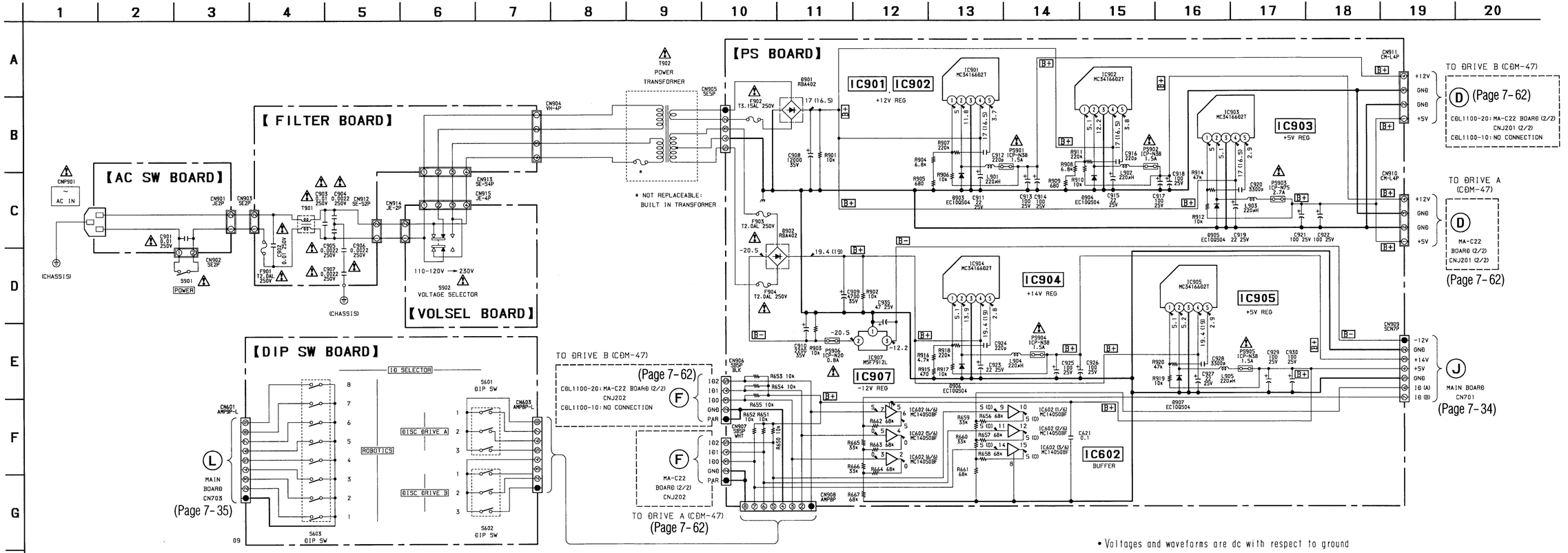
Ref. No.	Location
D901	E-14
D902	D-15
D903	E-4
D904	D-4
D905	C-3
D906	C-14
D907	C-14
IC602	C-9
IC901	E-4
IC902	D-4
IC903	C-4
IC904	C-14
IC905	D-15
IC907	B-16



Note:

- ⟜ : parts extracted from the component side.
- ○ : Through hole.
- ▨ : Pattern from the side which enable seeing.
- ▨ : Pattern of the rear side.

SCHEMATIC DIAGRAM — POWER SUPPLY SECTION —
• See page 7-70 for IC Block Diagrams.



NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- ▭ : panel designation.

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- B+ : B+ Line.
- B- : B- Line.

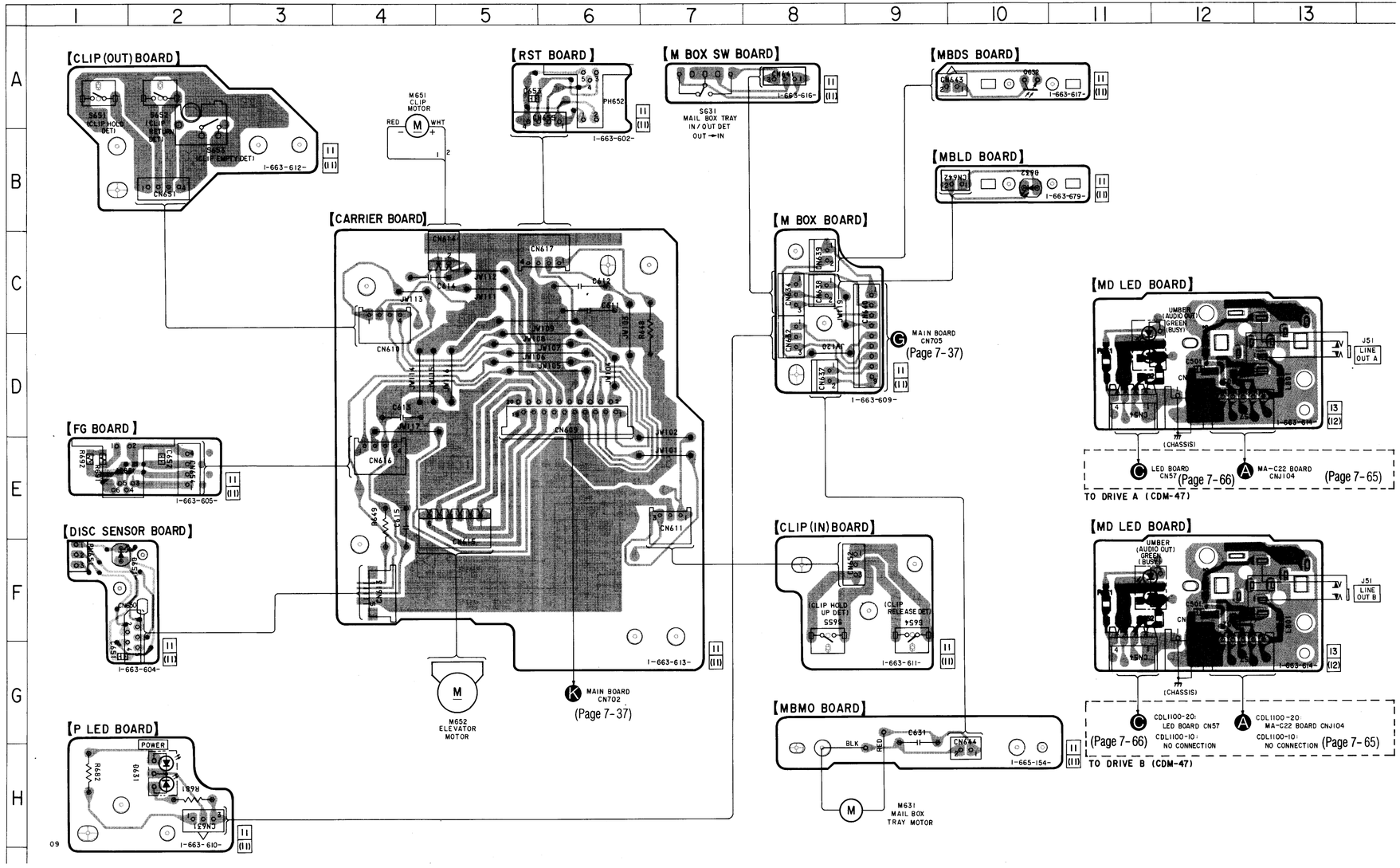
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: STOP (The state in which the power switch is ON)
  ( ) : PLAY (The state in which the CDM-47 is set to the single-operation) (X1 speed, Play Audio (23'47''))
  * : can not be measured.
  For details of how to set the CDM-47 to single-operation, refer to 6.2.2 Setting Single-Operation of CDM-47 Mechanism Block on page 6-4.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

PRINTED WIRING BOARD — CARRIER, MAIL BOX SECTION —

• See page 7-1 for Circuit Boards Location.

• **Semiconductor Location**

Ref. No.	Location
D51A	D-11
D51B	F-11
D631	H-2
D632	B-10
D651	F-1
IC651	E-1
PH651	F-1
PH652	A-6
Q632	A-10



Note:

- ⟜ : parts extracted from the component side.
- ○ : Through hole.
- ▓ : Pattern from the side which enable seeing.
- ▒ : Pattern of the rear side.

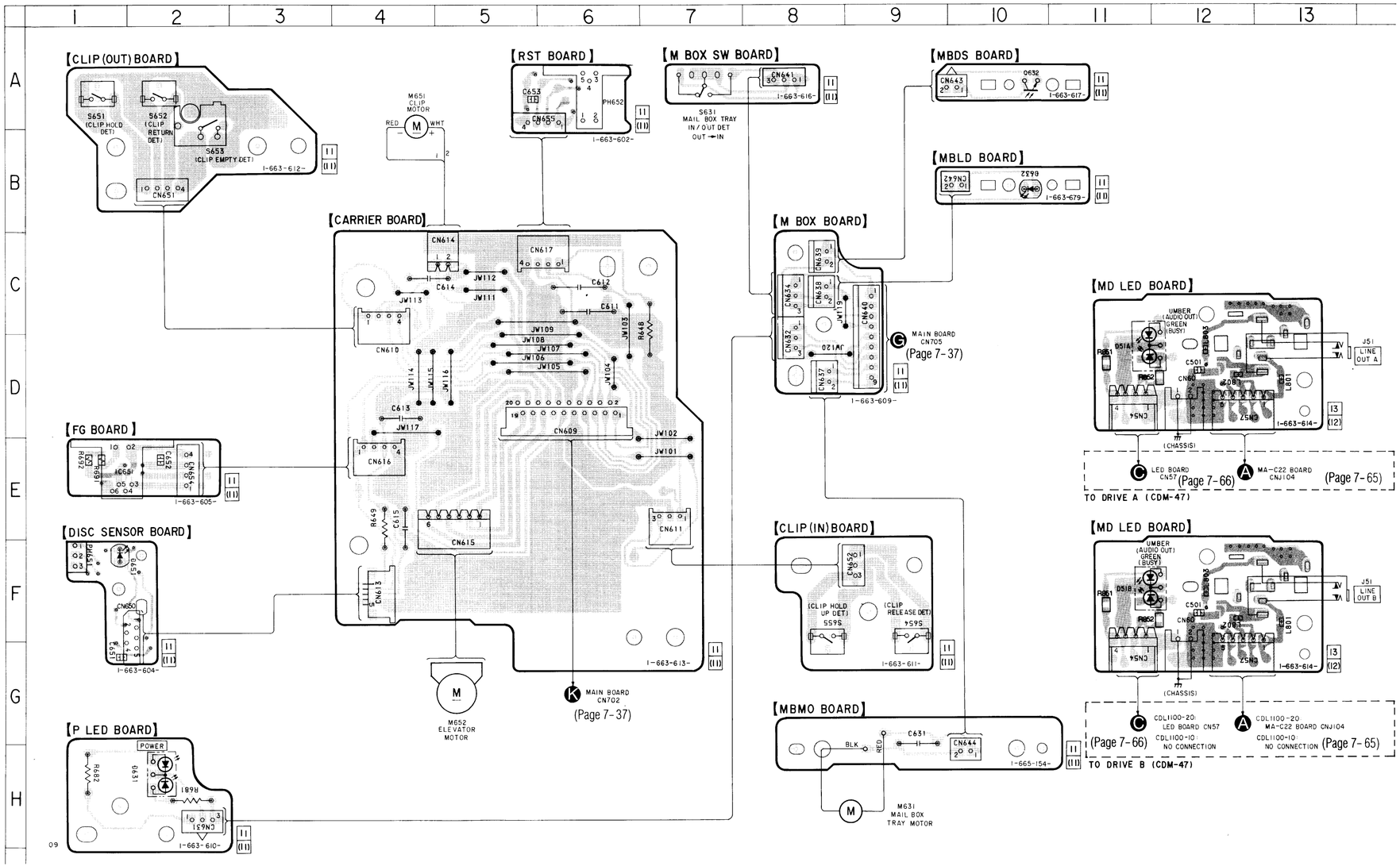
PRINTED WIRING BOARD — CARRIER, MAIL BOX SECTION —

• See page 7-1 for Circuit Boards Location.

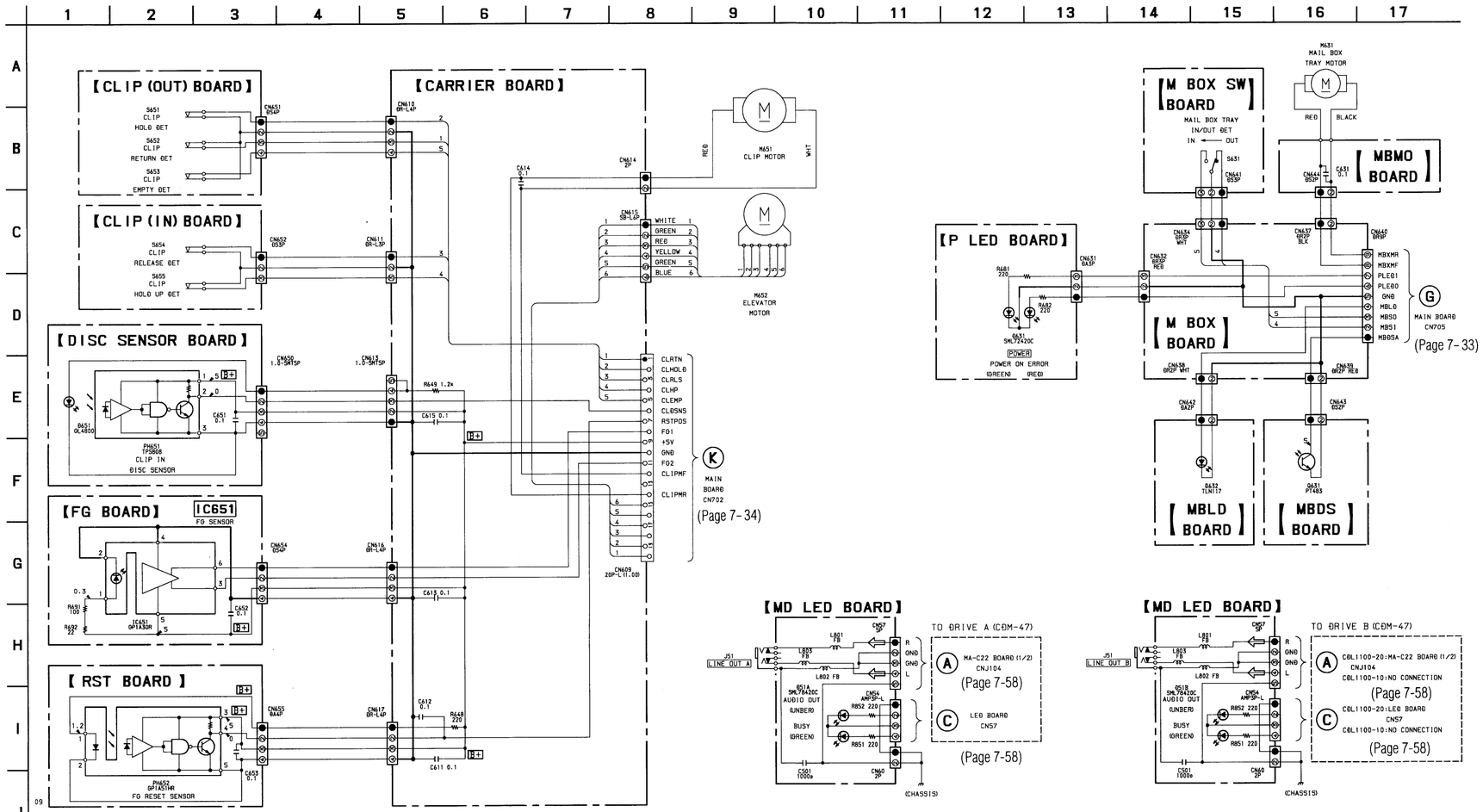
• **Semiconductor Location**

Ref. No.	Location
D51A	D-11
D51B	F-11
D631	H-2
D632	B-10
D651	F-1
IC651	E-1
PH651	F-1
PH652	A-6
Q632	A-10

Note:
- ⟷ : parts extracted from the component side.
- ○ : Through hole.
- ▒ : Pattern from the side which enable seeing.



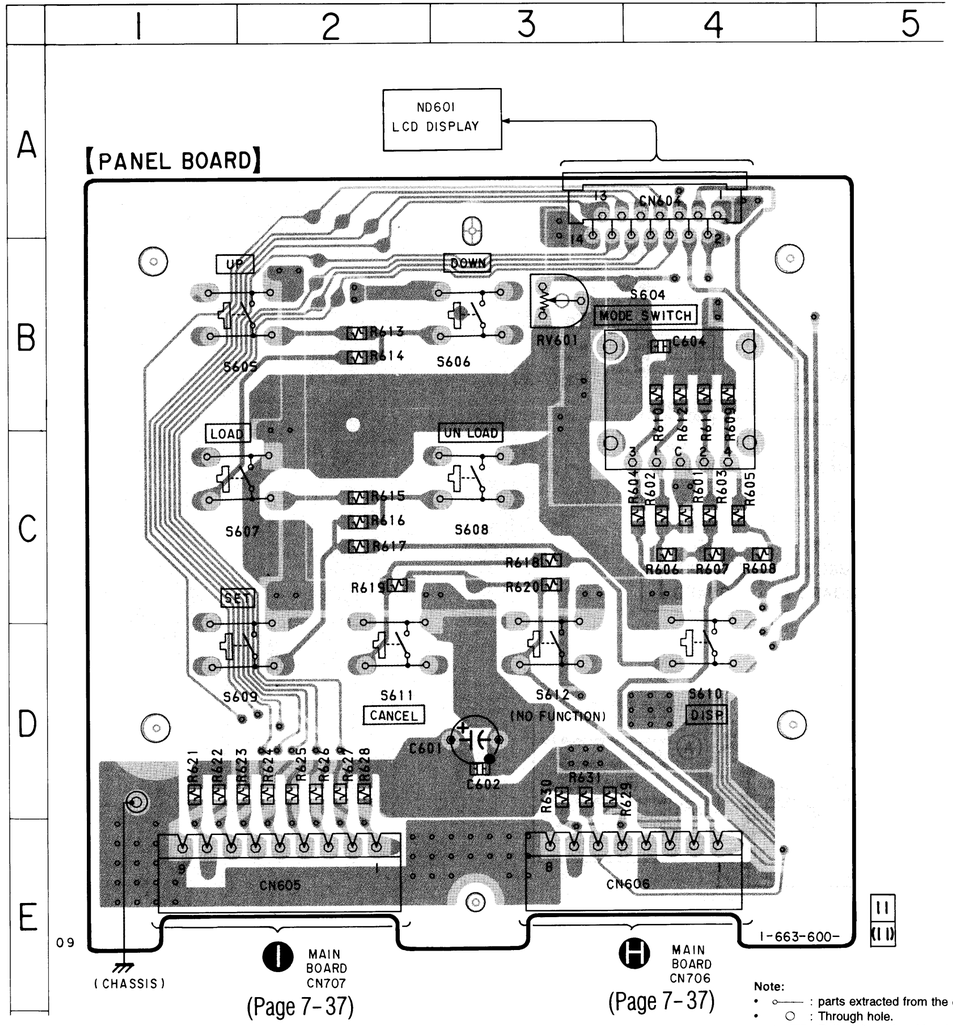
SCHEMATIC DIAGRAM — CARRIER, MAIL BOX SECTION —



NOTE

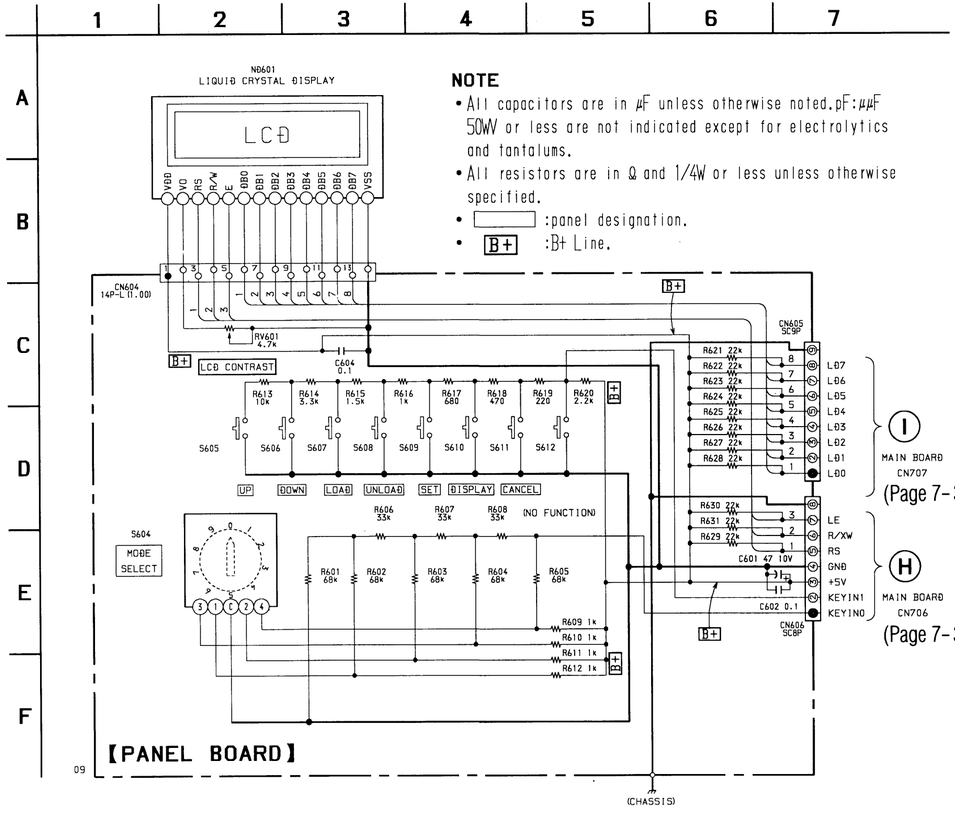
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- ▭ :panel designation.
- B+ :B+ Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path. ⇨ :AUDIO

PRINTED WIRING BOARD — PANEL SECTION —
• See page 7-1 for Circuit Boards Location.



Note:
- ⟜ : parts extracted from the component side.
- ○ : Through hole.
- ▒ : Pattern from the side which enable seeing.
- : Pattern of the rear side.

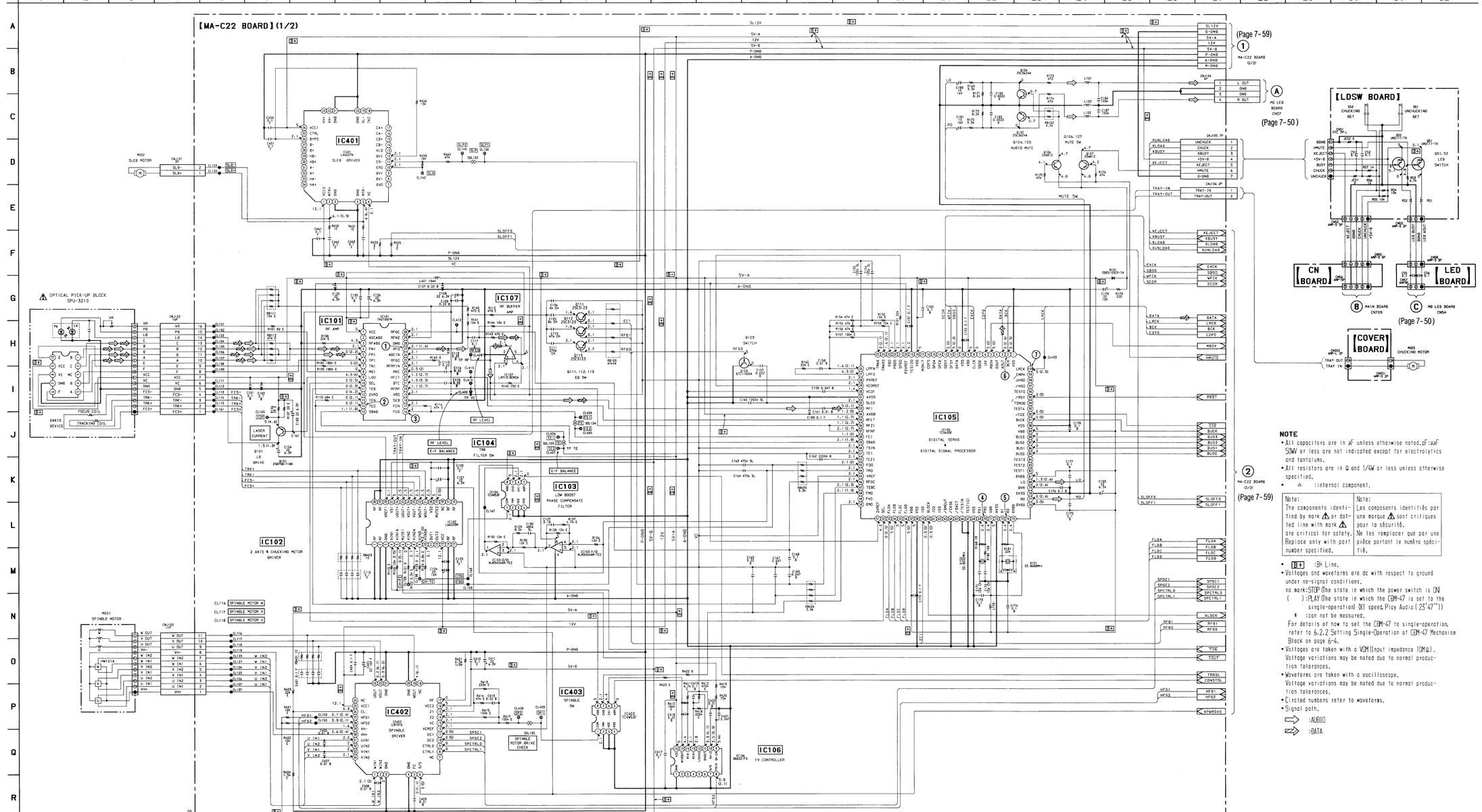
SCHEMATIC DIAGRAM — PANEL SECTION —



SCHEMATIC DIAGRAM — CD-ROM DRIVE (CDM-47) (1/2) SECTION —

• See page 7-70 for IC Block Diagrams.
• See page 7-2 for IC Pin Functions.
• See page 7-63 for Printed Wiring Board.

【MA-C22 BOARD】(1/2)



• Waveforms

① 1Vp-p — (PLAY) IC101 ㉗ RFO

② APPROX 40mVp-p — (PLAY) IC101 ㉔ TEO

③ APPROX 10mVp-p — (PLAY) IC101 ⑯ FEO

④ 0.6Vp-p — 50.8032MHz — IC105 ㊽ PXO

⑤ 3.5Vp-p — 33.8688MHz — IC105 ㊾ XO

⑥ 5Vp-p — 1.412MHz — (PLAY) IC105 ② BCK

⑦ 5Vp-p — 44.1kHz — (PLAY) IC105 ⑩ LRCK

NOTE

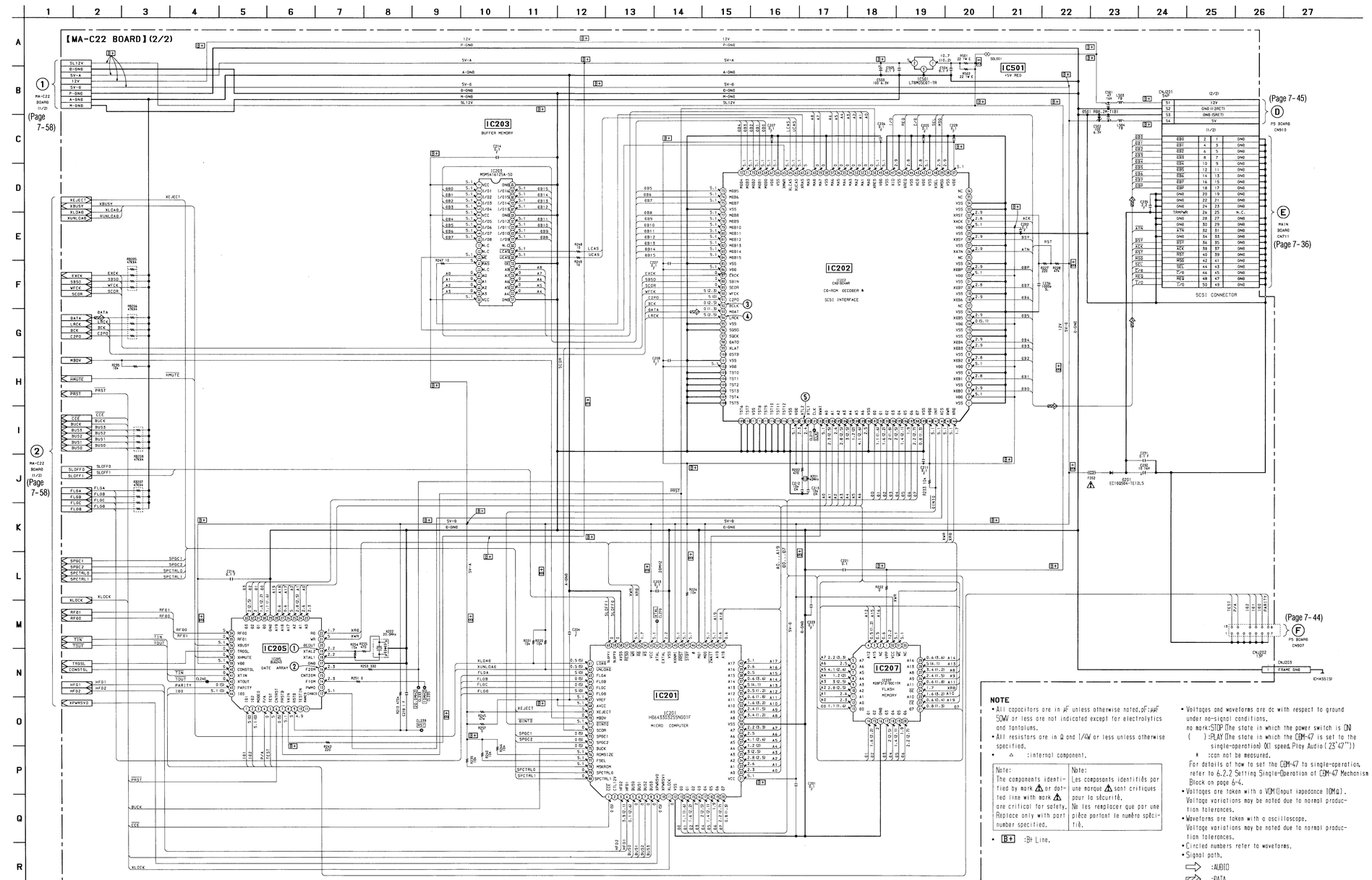
- All capacitors are in μF unless otherwise noted. pF: μF. 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : Internal component.

Note:	Note:
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- B+ : B+ Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : STOP (The state in which the power switch is ON)
  ( ) : PLAY (The state in which the CDM-47 is set to the single-operation) (X1 speed, Play Audio (23'47"))
  * : can not be measured.
  For details of how to set the CDM-47 to single-operation, refer to 6.2.2 Setting Single-Operation of CDM-47 Mechanism Block on page 6-4.
- Voltages are taken with a VOM (Input impedance 10MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : AUDIO
  ⇨ : DATA

SCHEMATIC DIAGRAM — CD-ROM DRIVE (CDM-47) (2/2) SECTION —

- See page 7-70 for IC Block Diagrams.
- See page 7-2 for IC Pin Functions.



NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.

Note:	Note:
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- B+ : B+ Line.

- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: STOP (The state in which the power switch is ON)
  ( ) : PLAY (The state in which the CDM-47 is set to the single-operation) (X1 speed, Ploy Audio (23'47"))
  * : can not be measured.
  For details of how to set the CDM-47 to single-operation, refer to 6.2.2 Setting Single-Operation of CDM-47 Mechanism Block on page 6-4.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : AUDIO
  ⇨ : DATA

• Waveforms

① 4.3Vp-p
20MHz
IC205 ⑲ XTAL2

② 5.6Vp-p
20MHz
IC205 ⑥ F20M

③ 5.1Vp-p
1.412MHz
(PLAY)
IC202 ⑳ BCLK

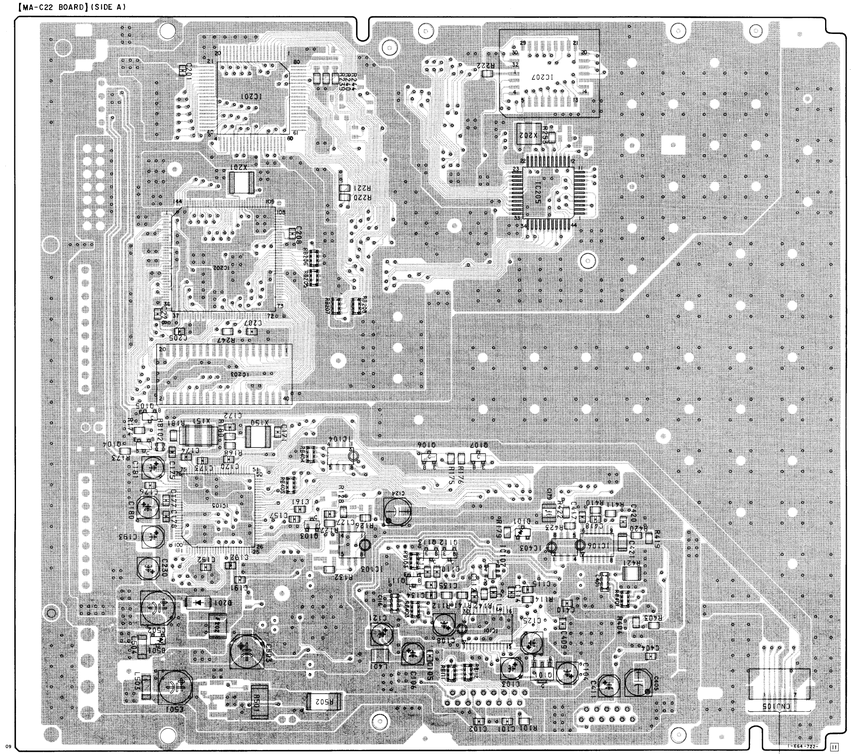
④ 5Vp-p
44.2MHz
(PLAY)
IC202 ㉑ LRCK

⑤ 3Vp-p
40MHz
IC202 ⑲ XTL2

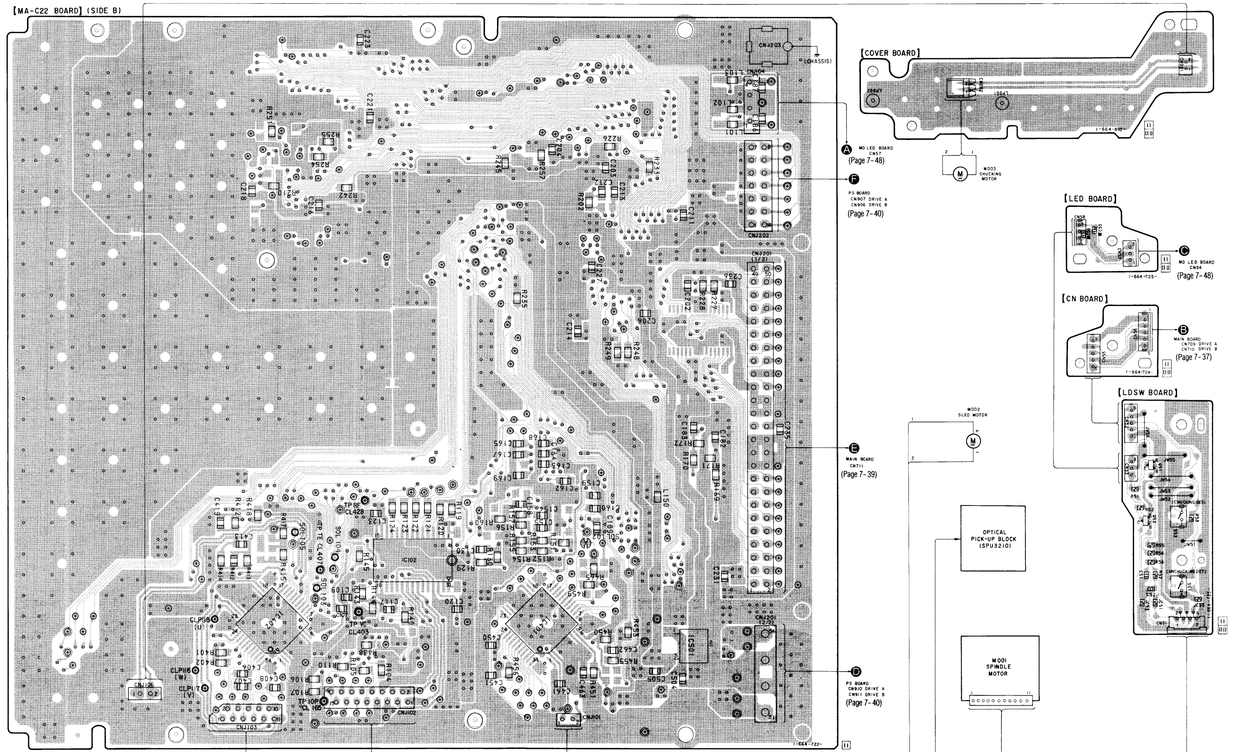
PRINTED WIRING BOARD — CD-ROM DRIVE (CDM-47) SECTION —

• See page 7-1 for Circuit Boards Location.

[MA-C22 BOARD] (SIDE A)



[MA-C22 BOARD] (SIDE B)



• **Semiconductor Location**

Ref. No.	Location
D101	J-8
D102	J-4
D501	K-3
IC101	J-8
IC102	I-20
IC103	I-6
IC104	H-6
IC105	H-4
IC106	I-10
IC107	I-8
IC201	B-4
IC202	E-4
IC203	F-4
IC204	F-25
IC205	D-9
IC207	B-9
IC401	J-22
IC402	J-18
IC403	I-9
IC501	J-25
Q51	H-32
Q52	I-32
Q101	K-9
Q103	I-5
Q104	H-3
Q105	G-3
Q106	H-7
Q107	H-8
Q111	J-7
Q112	I-8
Q113	I-7

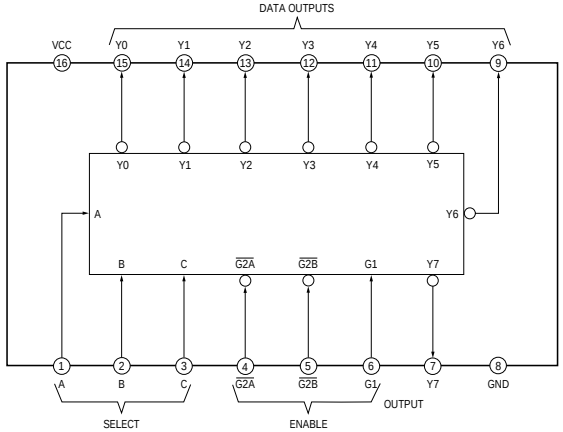
Note:

- ⟷ : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- ○ : Through hole.
- ▒ : Pattern from the side which enable seeing. (The other layer's patterns are not indicated.)

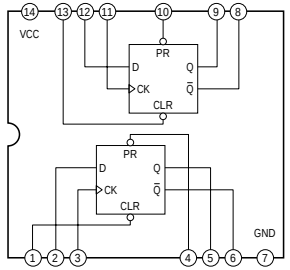
7-6. IC BLOCK DIAGRAMS

• Main section

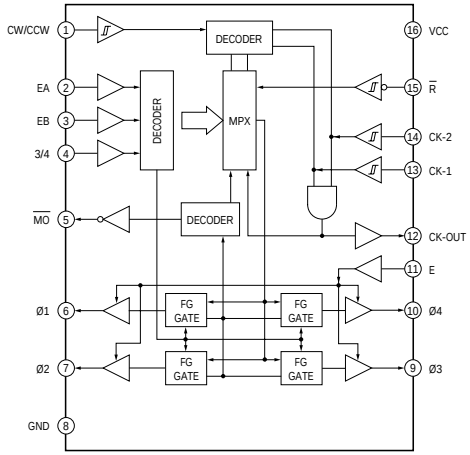
IC705 SN74HC138ANS



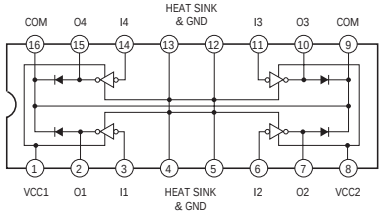
IC707 SN74HC74ANS



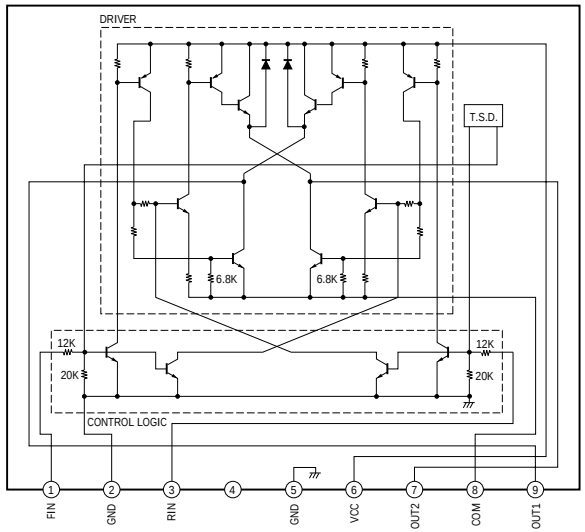
IC710 TA8415P



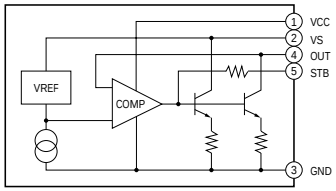
IC711 TD62308AP



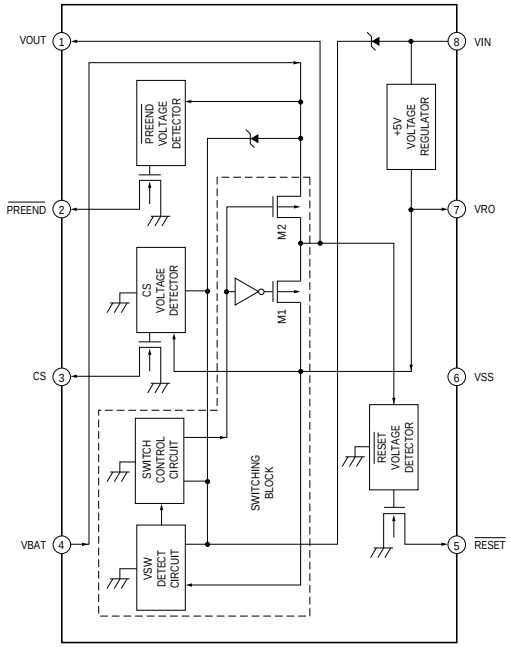
IC714 BA6418N



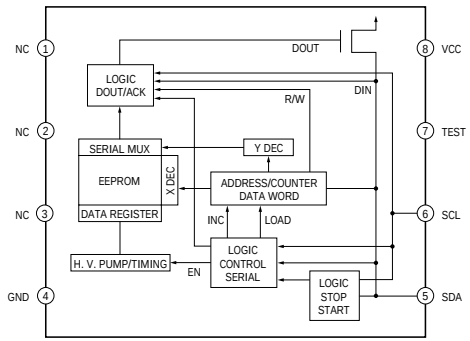
IC715 LA5536



IC716 S-8420AF

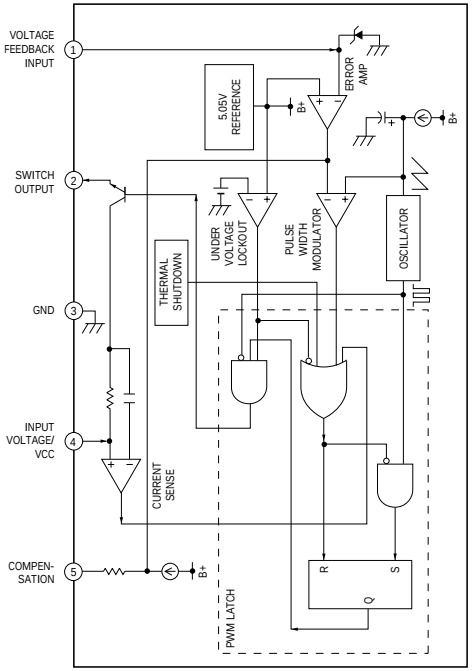


IC719 AT24C01SC



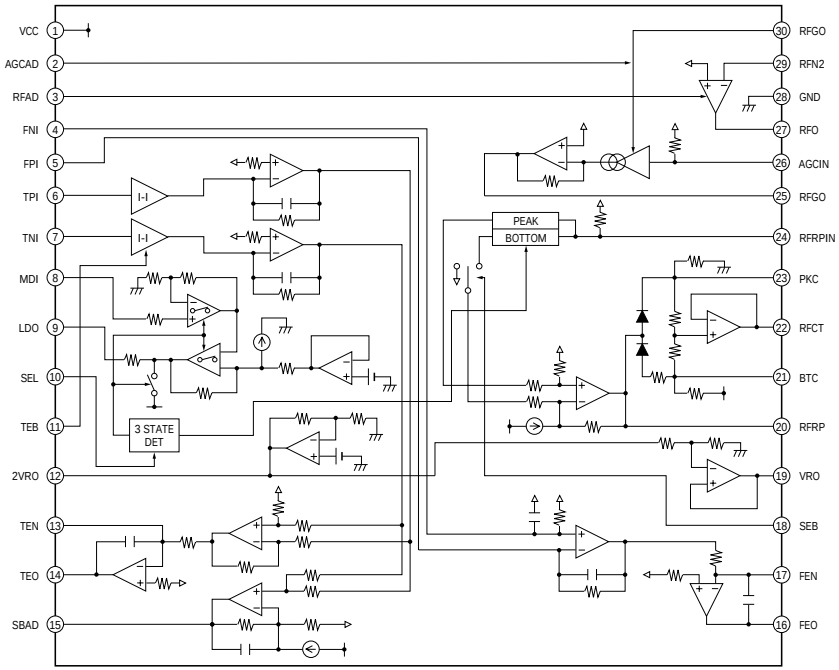
• **Power section**

IC901, 902, 903, 904, 905 MC34166-D2-TR4

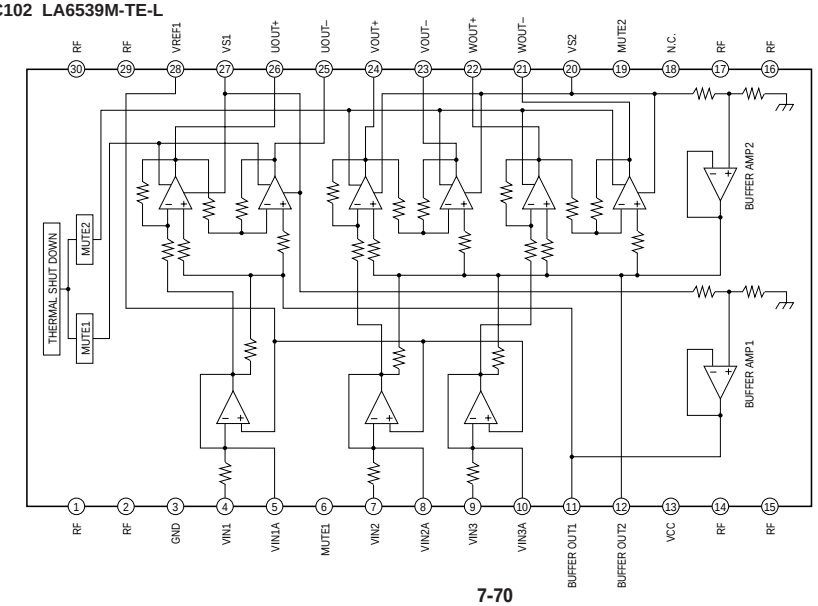


• **CD-ROM Drive section (CDM-47)**

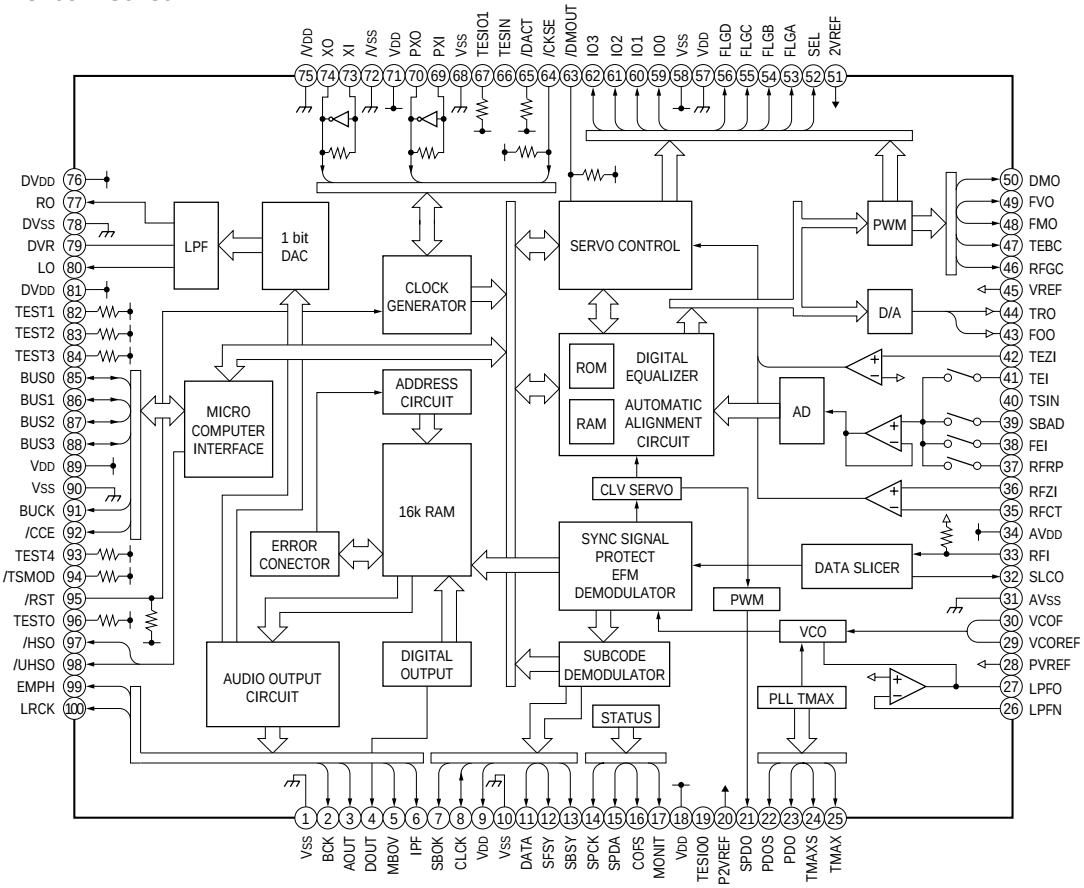
IC101 TA2106FN



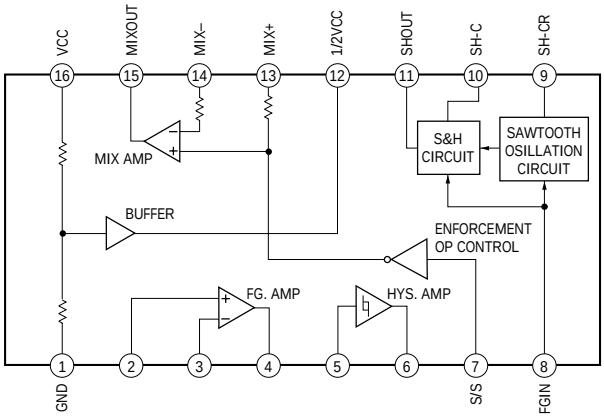
IC102 LA6539M-TE-L



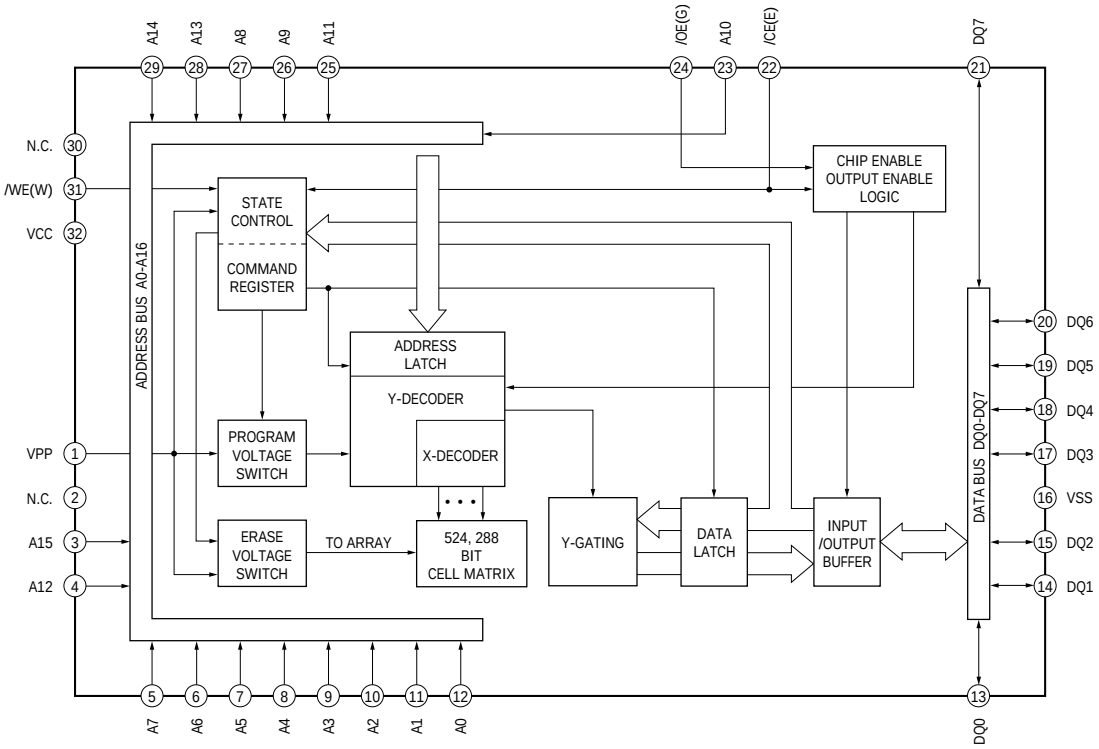
IC105 TC9439F



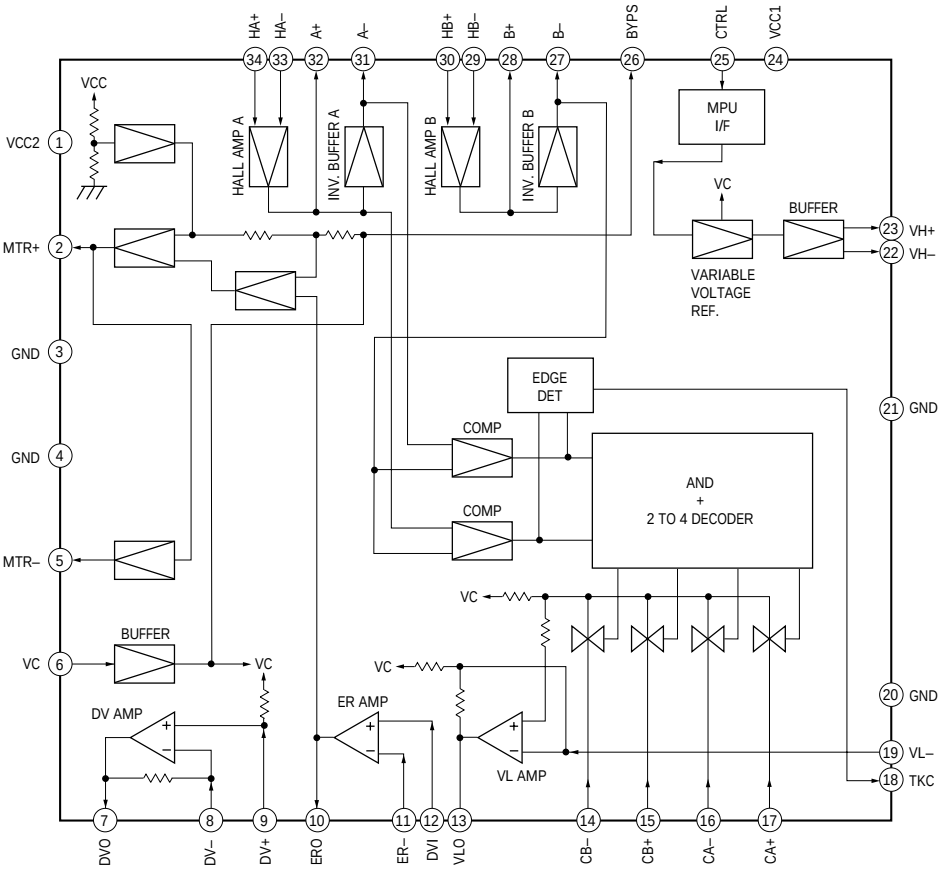
IC106 BA6321FS-E2



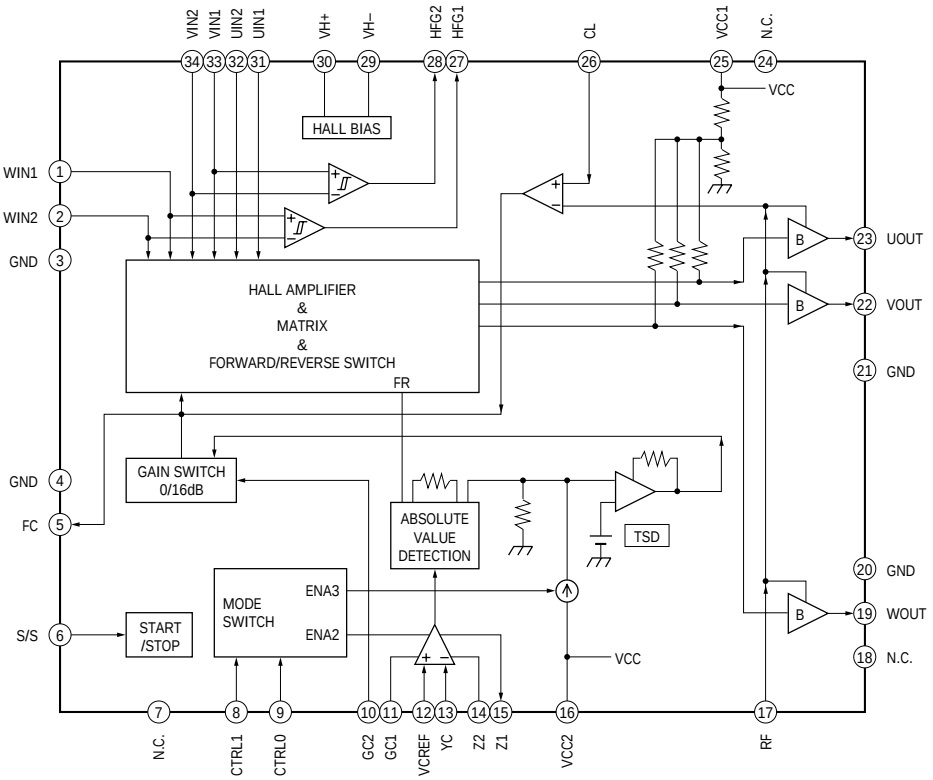
IC207 AM28F512-90JC/T



IC401 LA6527N



IC402 LB1916



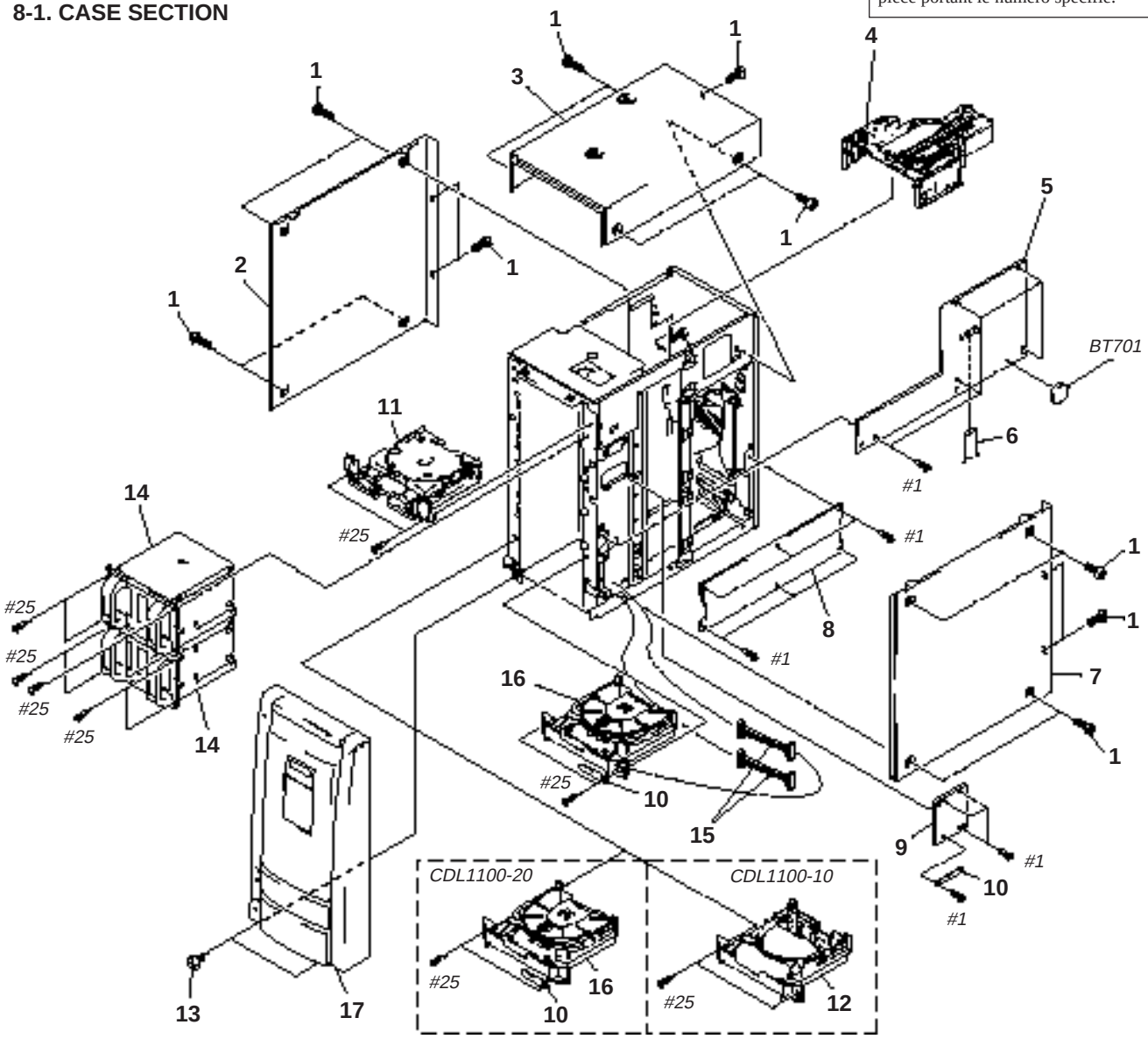
SECTION 8
EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

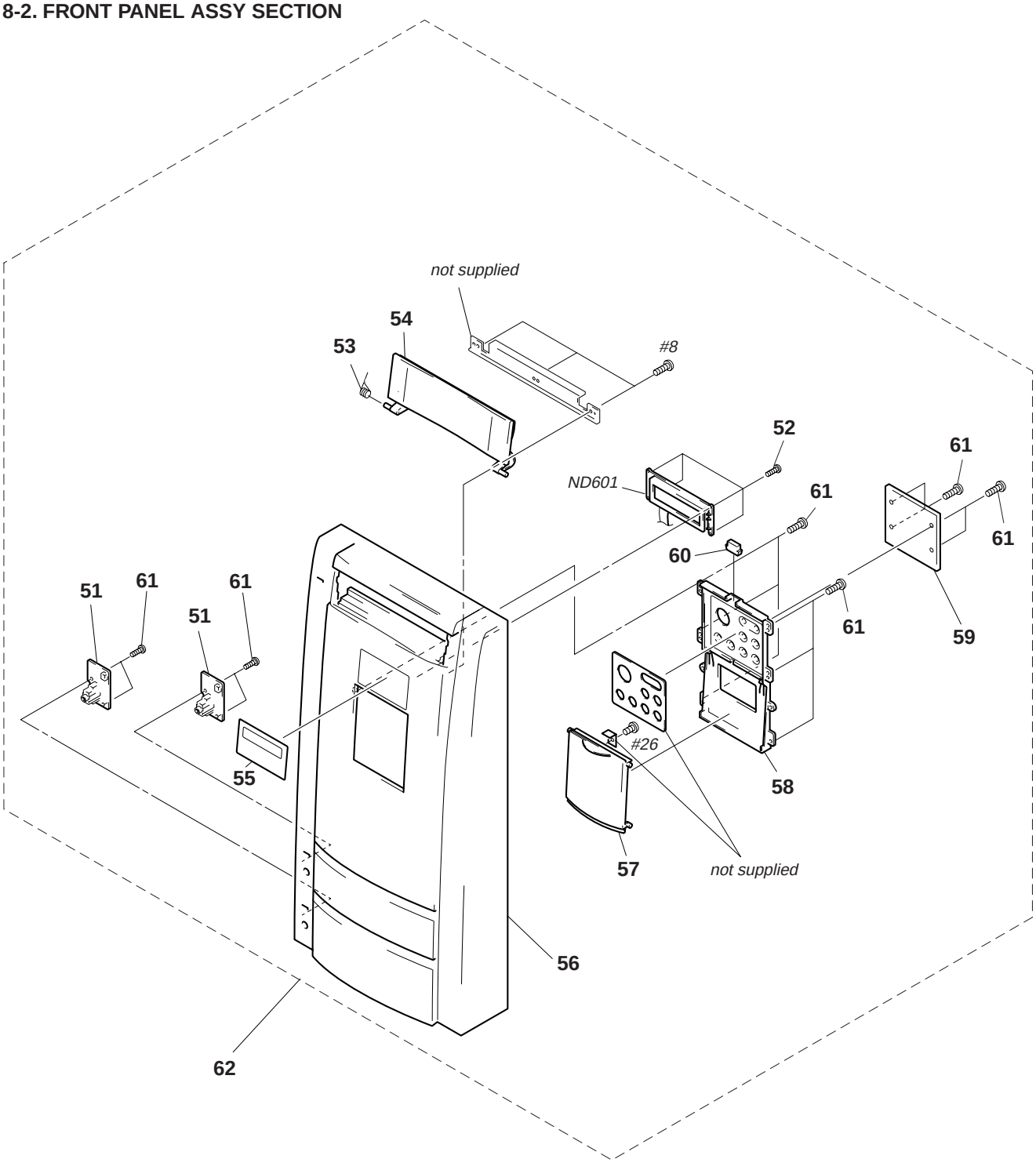
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

8-1. CASE SECTION



Ref. No.	Part No.	Description	Remark
1	3-704-366-41	SCREW (CASE) (M3X6)	
* 2	4-986-618-01	CASE (L)	
* 3	4-986-636-01	CASE (TOP)	
4	A-4672-421-A	CARRIER ASSY	
* 5	A-4699-367-A	MAIN BOARD, COMPLETE	
6	1-777-656-11	WIRE (FLAT TYPE) (20 CORE)	
* 7	4-986-619-01	CASE (R)	
* 8	A-4699-382-A	PS BOARD, COMPLETE	
* 9	A-4699-369-A	SERVICE BOARD, COMPLETE	
* 10	4-908-882-01	CLAMP	
11	A-4672-423-A	BOX ASSY, MAIL	
* 12	4-986-147-02	BASE, MD (CDL1100-10)	
13	2-236-956-00	SCREW, STEP	
14	A-4672-422-A	CASE ASSY, DISC	
15	1-782-606-11	LEAD (WITH CONNECTOR)	
16	A-4672-424-A	CDM-47 ASSY	
17	A-4672-420-A	FRONT ASSY	
BT701	1-528-229-41	BATTERY, LITHIUM (CR-2450)	

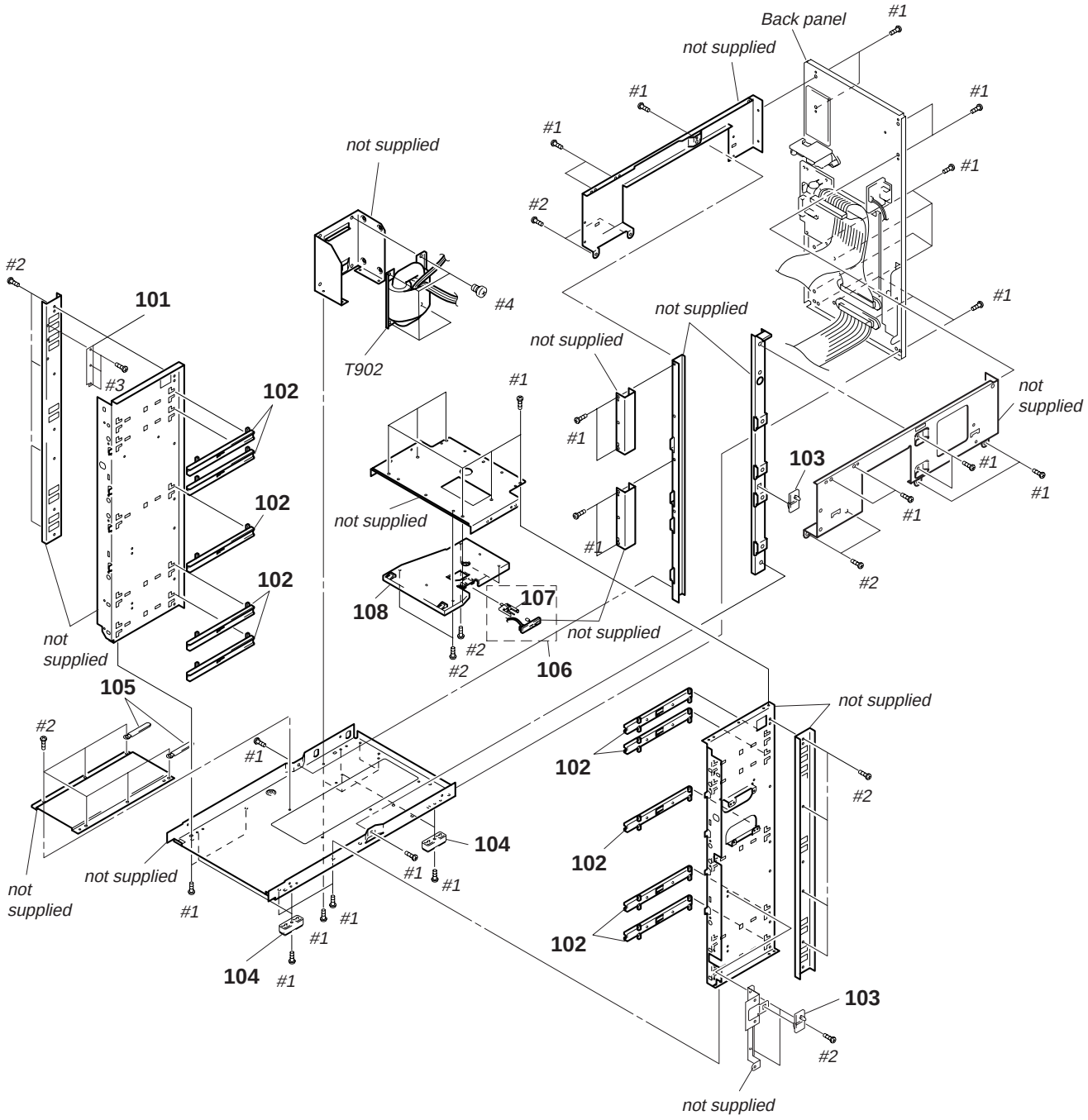
8-2. FRONT PANEL ASSY SECTION



Ref. No.	Part No.	Description	Remark
* 51	A-4699-393-A	MD LED BOARD, COMPLETE	
52	3-703-454-21	SCREW (1.7X6), TAPPING	
53	4-992-931-01	SPRING (FL), TORSION	
54	4-986-620-01	LID (MAIL)	
* 55	4-986-174-01	WINDOW (LCD)	
56	X-4947-778-1	PANEL ASSY, FRONT	
57	4-986-170-01	LID (CONT)	

Ref. No.	Part No.	Description	Remark
* 58	4-986-171-01	BRACKET (CONT)	
* 59	A-4699-371-A	PANEL BOARD, COMPLETE	
60	3-950-280-01	MAGNET	
61	4-951-620-01	SCREW (2.6X8), +BVTP	
62	A-4672-420-A	FRONT ASSY	
ND601	1-801-530-11	DISPLAY PANEL, LIQUID CRYSTAL	

8-3. CHASSIS SECTION

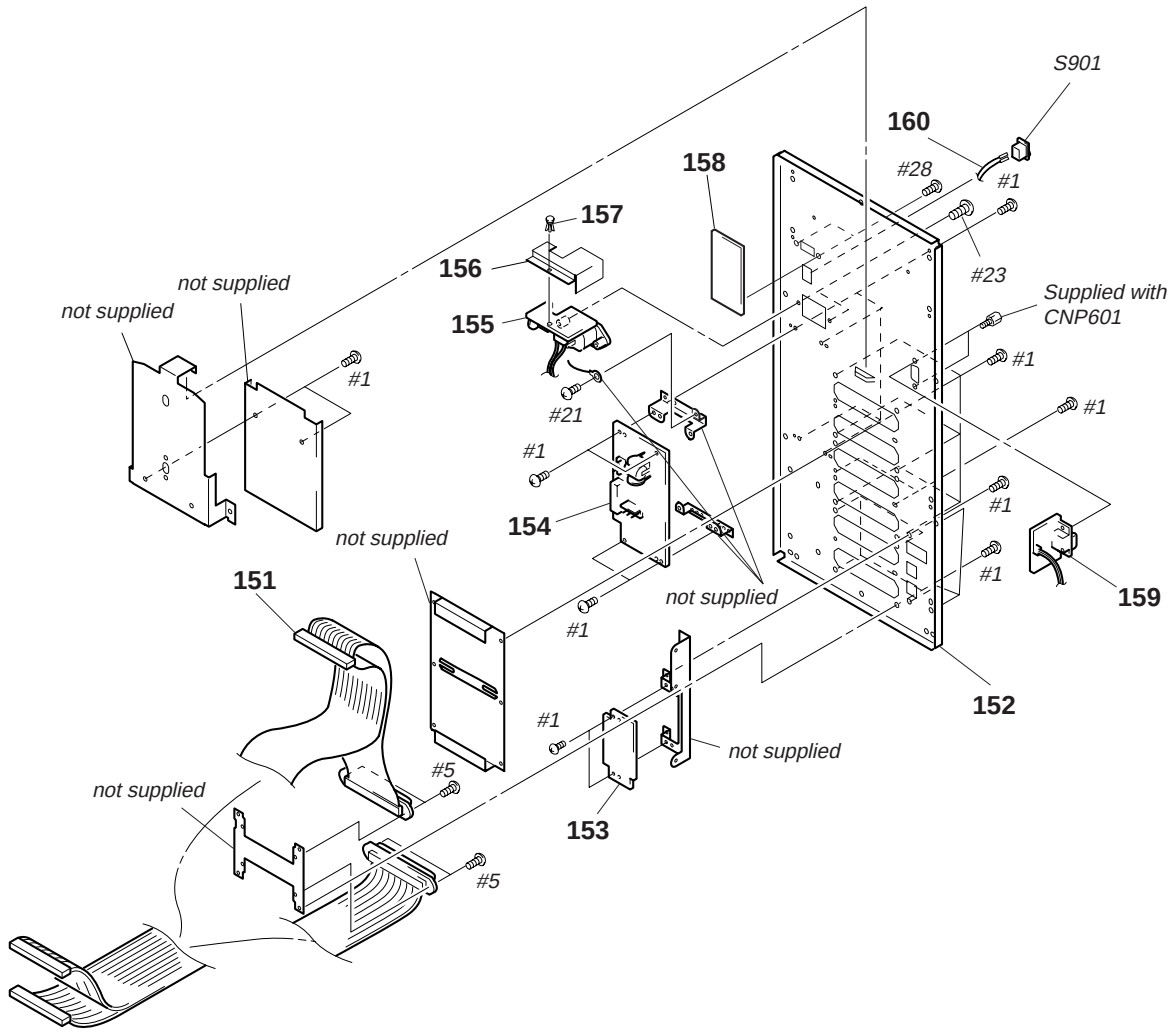


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
* 101	4-986-646-01	PLATE (RESET), INTERCEPTION	
* 102	4-986-639-01	GUIDE (CASE)	
* 103	3-701-832-00	HINGE, CIRCUIT BOARD	
104	4-932-564-01	FOOT (W) (SQUARE)	
* 105	4-908-882-01	CLAMP	

Ref. No.	Part No.	Description	Remark
* 106	A-4699-395-A	MBDS BOARD, COMPLETE	
107	4-964-461-02	HOLDER (SENSOR)	
* 108	4-986-647-01	LOCK (PANEL)	
⚠T902	1-429-912-11	TRANSFORMER, POWER	

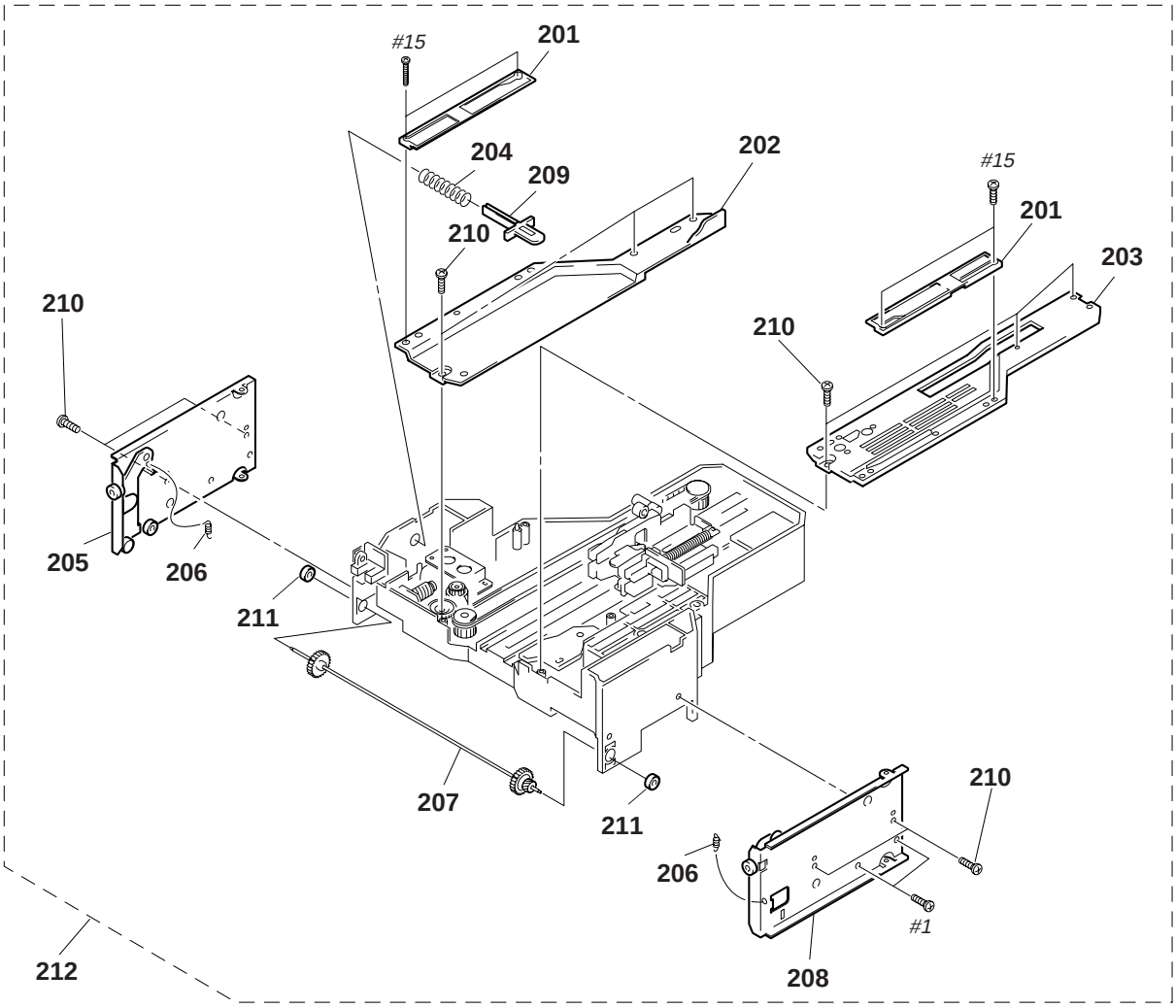
8-4. BACK PANEL SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
151	1-777-657-11	CORD (WITH CONNECTOR)	
152	4-986-635-01	PANEL, BACK	
* 153	A-4699-373-A	DIP SW BOARD, COMPLETE	
* 154	A-4699-384-A	FILTER BOARD, COMPLETE	
* 155	A-4699-377-A	AC SW BOARD, COMPLETE	
* 156	4-991-755-01	COVER (PR)	
157	4-812-134-11	RIVET (DIA. 3.5), NYLON	
* 158	A-4699-779-A	VOLSEL BOARD, COMPLETE	
* 159	A-4699-385-A	RS BOARD, COMPLETE	
160	1-782-471-11	LEAD (WITH CONNECTOR) (2 CORE)	
⚠ S901	1-762-876-11	SWITCH, AC POWER (POWER)	

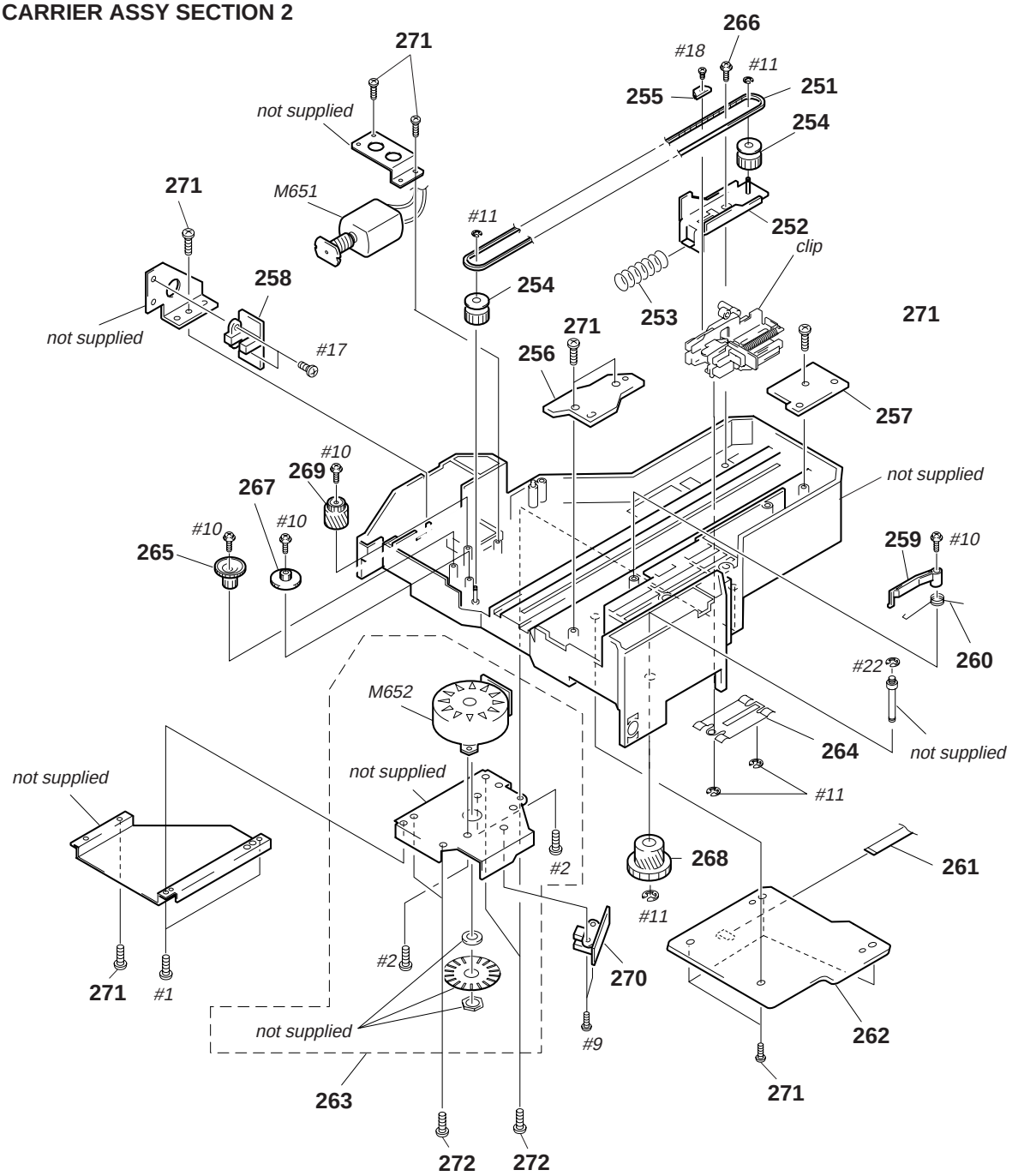
8-5. CARRIER ASSY SECTION 1



Ref. No.	Part No.	Description	Remark
* 201	4-985-963-01	GUIDE, DISC	
* 202	4-985-954-02	COVER (L), CARRIER	
* 203	4-985-953-01	COVER (R), CARRIER	
204	4-986-029-01	SPRING, COMPRESSION	
* 205	A-4672-204-A	BRACKET (GUIDE R) ASSY	
206	4-985-981-01	SPRING, TENSION	

Ref. No.	Part No.	Description	Remark
* 207	X-4947-665-1	SHAFT (JOINT) ASSY	
* 208	A-4672-205-A	BRACKET (GUIDE L) ASSY	
* 209	4-985-964-02	LIMITTER (DISC)	
210	4-992-954-01	SCREW (2.6X8), +B	
211	4-950-944-01	BEARING (NO FLANGE), BALL	
212	A-4672-421-A	CARRIER ASSY	

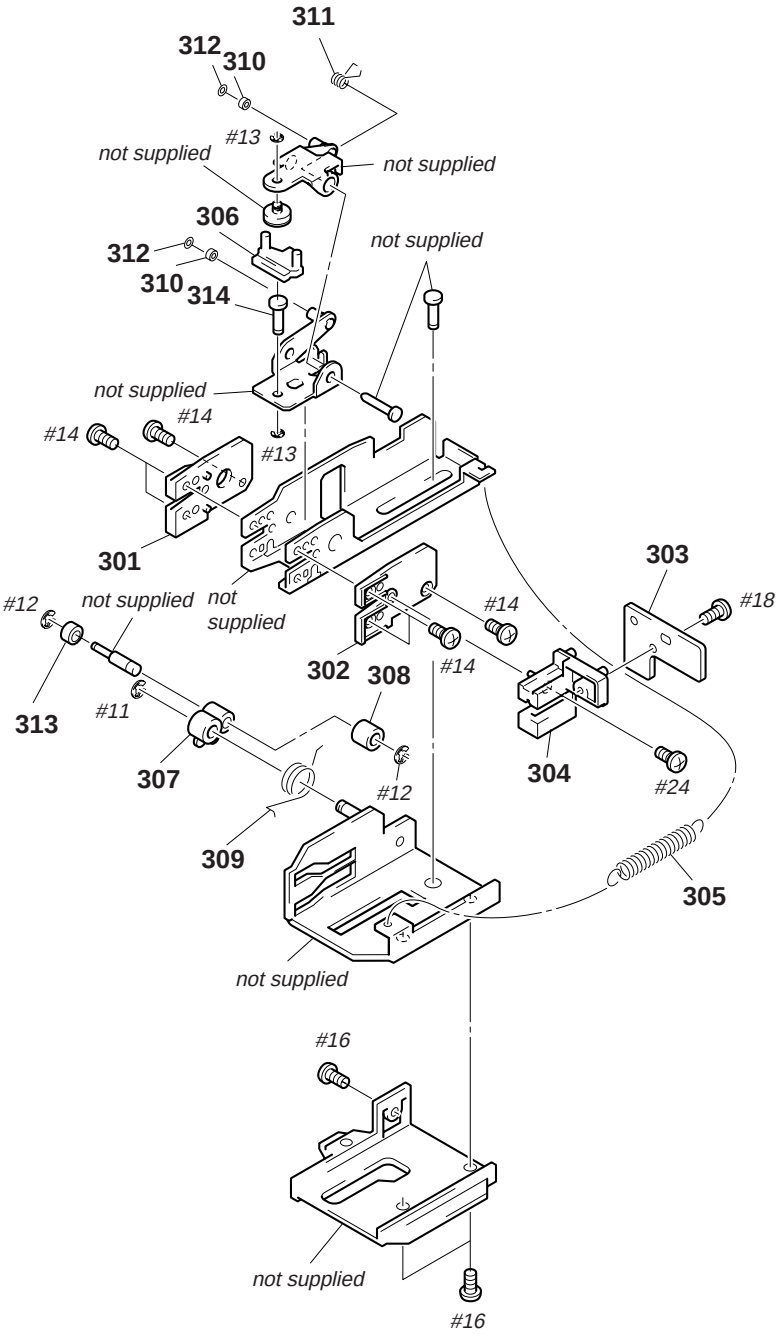
8-6. CARRIER ASSY SECTION 2



Ref. No.	Part No.	Description	Remark
251	4-985-956-01	BELT, TIMING	
* 252	X-4947-666-1	TENSIONER (BELT) ASSY	
253	4-985-951-01	SPRING (TENSIONER), COIL	
* 254	X-4947-678-2	PULLEY (TIMING BELT) ASSY	
* 255	4-985-983-01	RETAINER (TIMING BELT)	
* 256	A-4699-390-A	CLIP (OUT) BOARD, COMPLETE	
* 257	A-4699-389-A	CLIP (IN) BOARD, COMPLETE	
* 258	A-4699-375-A	RST BOARD, COMPLETE	
259	4-985-948-01	LEVER (SW)	
260	4-985-949-01	SPRING (SW LEVER), TORSION	
261	1-777-655-11	WIRE (FLAT TYPE) (5 CORE)	
* 262	A-4699-391-A	CARRIER BOARD, COMPLETE	

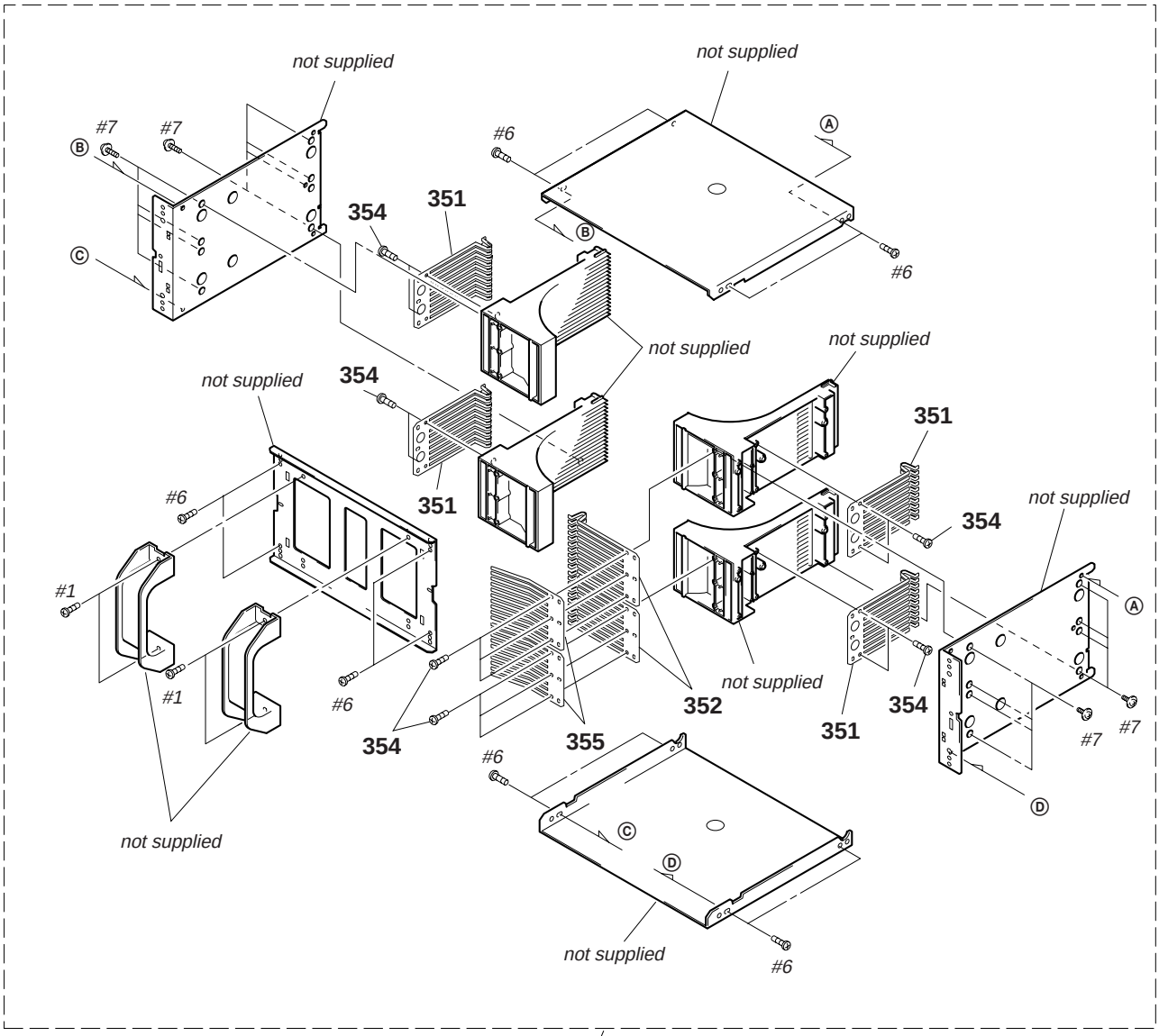
Ref. No.	Part No.	Description	Remark
* 263	A-4672-203-A	BRACKET (EVM) ASSY	
* 264	4-985-992-01	SLIDER (B)	
265	4-985-959-01	GEAR (G)	
266	4-991-702-01	SCREW (2.6X6) (HEXAGON SLOTTED)	
267	4-985-960-01	GEAR (C)	
268	4-985-969-01	GEAR (EVD)	
269	4-985-999-01	GEAR (HELICAL)	
* 270	A-4699-380-A	FG BOARD, COMPLETE	
271	4-992-954-01	SCREW (2.6X8), +B	
272	4-951-620-01	SCREW (2.6X8), +BVTP	
M651	X-4947-679-1	MOTOR (CLIP) ASSY	
M652	X-4947-664-1	MOTOR (EV) ASSY (ELEVATOR)	

8-7. CARRIER ASSY SECTION 3



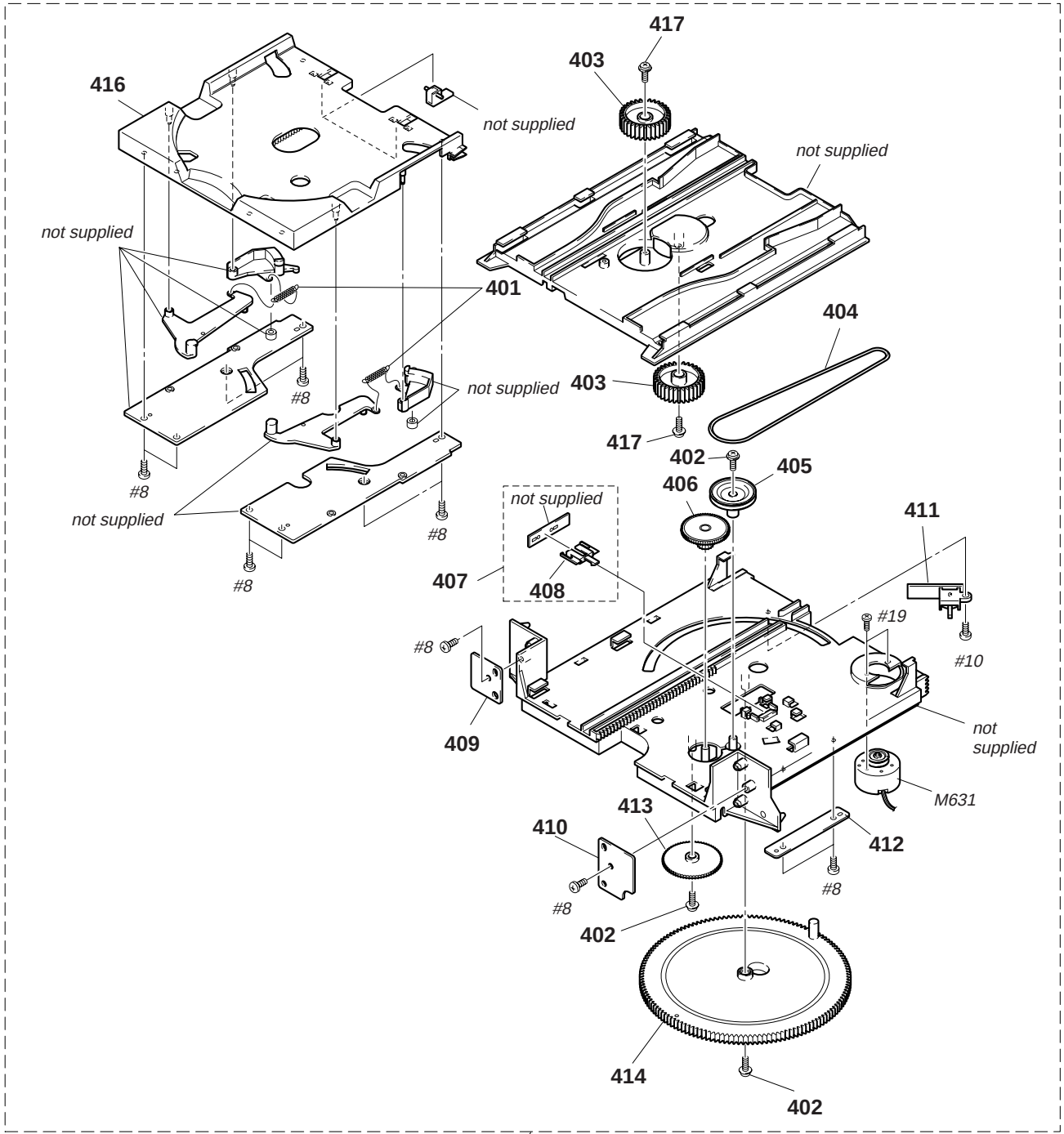
Ref. No.	Part No.	Description	Remark
* 301	4-985-990-01	GUIDE (L), CLIP	
* 302	4-985-991-01	GUIDE (R), CLIP	
* 303	A-4699-378-A	DISC SENSOR BOARD, COMPLETE	
* 304	4-986-007-01	HOLDER (PH)	
305	4-986-028-01	SPRING (CLIP), TENSION	
* 306	4-985-987-01	GUIDE (CLIP L)	
* 307	4-985-993-01	LEVER (LIMITTER)	
* 308	4-986-000-01	ROLLER (LIMITTER)	
309	4-986-006-01	SPRING (LIMITTER), TORSION	
* 310	4-986-004-01	ROLLER (CLIP LEVER)	
311	4-986-027-01	SPRING (CLIP), TORSION	
312	3-315-414-00	WASHER	
* 313	4-988-997-01	ROLLER (LIMITER CAM)	
314	4-985-988-01	SHAFT (CLIP A)	

8-8. DISC CASE ASSY SECTION



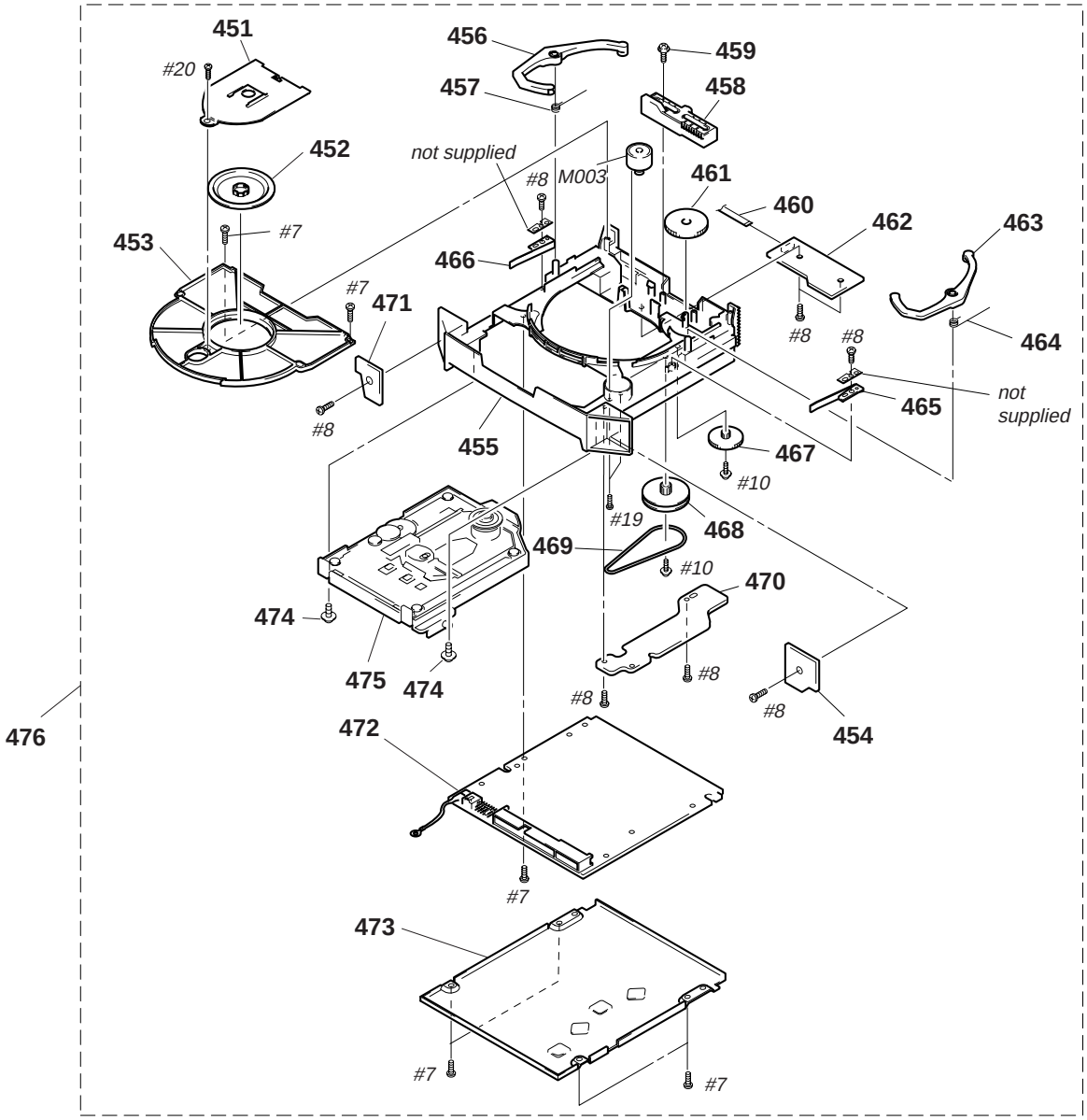
Ref. No.	Part No.	Description	Remark
351	4-986-021-01	SPRING (CASE), LEAF	
352	4-986-022-01	SPRING (SLIDE), LEAF	
353	A-4672-422-A	CASE ASSY, DISC	
354	4-951-620-01	SCREW (2.6X8), +BVTP	
355	4-986-022-11	SPRING (SLIDE), LEAF	

8-9. MAIL BOX ASSY SECTION



Ref. No.	Part No.	Description	Remark
401	3-569-657-00	SPRING, TENSION	
402	4-990-632-01	SCREW (2X8), +PTPWH	
403	4-986-143-02	GEAR (JOINT)	
404	4-986-140-01	BELT (T)	
405	4-986-137-01	GEAR (T1)	
406	4-986-138-01	GEAR (T2)	
* 407	A-4699-396-A	MBLD BOARD, COMPLETE	
408	4-964-461-02	HOLDER (SENSOR)	
* 409	A-4699-388-A	P LED BOARD, COMPLETE	
* 410	A-4699-386-A	M BOX BOARD, COMPLETE	
* 411	A-4699-394-A	M BOX SW BOARD, COMPLETE	
* 412	A-4699-397-A	MBMO BOARD, COMPLETE	
413	4-986-129-01	GEAR (T3)	
414	4-986-139-01	GEAR (CAM)	
415	A-4672-423-A	BOX ASSY, MAIL	
416	4-986-132-01	TRAY	
417	4-991-702-01	SCREW (2.6X6) (HEXAGON SLOTTED)	
M631	X-4947-713-1	MOTOR (T) ASSY (MAIL BOX TRAY)	

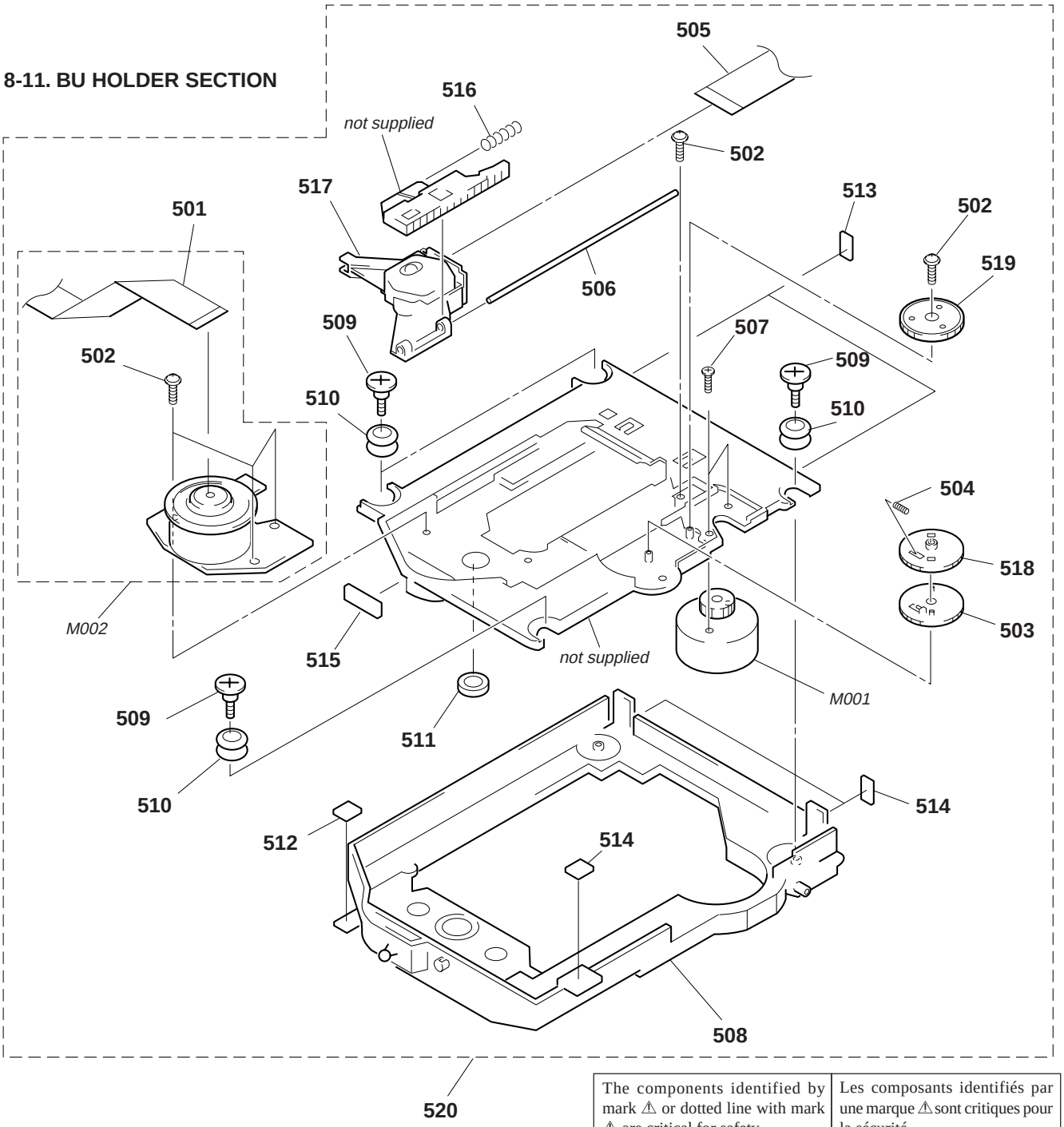
8-10. CDM-47 SECTION



Ref. No.	Part No.	Description	Remark
* 451	4-989-225-01	COVER, PULLEY	
452	A-4675-467-A	PULLEY ASSY, CHUCKING	
* 453	4-986-148-01	HOLDER, CHUCK	
* 454	1-664-724-11	CN BOARD	
* 455	4-986-147-02	BASE, MD	
456	A-4672-347-A	LEVER (PL) ASSY	
457	4-986-155-01	SPRING (PL), TORSION	
458	4-990-632-01	SCREW (2X8), +PTPWH	
459	4-986-149-01	CAM, CHUCK	
460	1-777-695-11	WIRE (FLAT TYPE) (7 CORE)	
461	4-986-160-01	GEAR (P3)	
* 462	A-4699-548-A	LDSW BOARD, COMPLETE	
463	A-4672-346-A	LEVER (PR) ASSY	
464	4-986-154-01	SPRING (PR), TORSION	

Ref. No.	Part No.	Description	Remark
465	4-986-152-01	SPRING (PR)	
466	4-986-153-01	SPRING (PL)	
467	4-986-158-01	GEAR (P2)	
468	4-986-157-01	GEAR (P1)	
469	4-986-159-01	BELT (P)	
* 470	1-664-892-11	COVER BOARD	
* 471	1-664-725-11	LED BOARD	
* 472	A-4630-794-A	MA-C22 BOARD, COMPLETE	
* 473	X-4947-711-1	PLATE ASSY, BOTTOM	
474	4-933-134-01	SCREW (+PTPWH M2.6X6)	
475	A-4672-419-A	BU-16 ASSY	
476	A-4672-424-A	CDM-47 ASSY	
M003	X-4947-712-1	MOTOR ASSY (CHUCK)	

8-11. BU HOLDER SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
501	1-777-692-11	WIRE (FLAT TYPE) (11 CORE)	
502	4-974-711-01	SCREW (2X5)(P TYIGHT),(+)PTTWH	
* 503	4-973-786-01	GEAR (S-C1)	
504	4-974-767-01	SPRING, COMPRESSION	
505	1-782-368-11	WIRE (FLAT TYPE) (16 CORE)	
* 506	4-974-724-01	SHAFT (MAIN)	
507	4-974-725-01	SCREW (M1.7X2.5), P	
* 508	4-989-037-01	HOLDER, BU	
509	4-981-923-01	SCREW (M), STEP	
510	4-984-534-01	INSULATOR	
511	4-985-404-01	CUSHION (BU SPINDLE)	
512	4-984-536-01	CUSHION (BU SIDE)	

Ref. No.	Part No.	Description	Remark
513	4-985-146-01	CUSHION (REAR)	
514	4-984-549-01	CUSHION (HOOK)	
515	4-984-537-01	CUSHION (FRONT)	
516	4-992-212-11	SPRING, COMPRESSION	
⚠517	1-758-007-11	OPTICAL PICK-UP (SPU-3210)	
518	4-983-031-01	GEAR (SC-2)	
519	4-988-781-01	GEAR (S-B)	
520	A-4672-419-A	BU-16 ASSY	
M001	A-4608-415-B	MOTOR ASSY (SLED)	
M002	A-4672-402-A	MOTOR ASSY (SPINDLE)	

SECTION 9
ELECTRICAL PARTS LIST

Note:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: µ , for example:
  uA...: µ A..., uPA...: µ PA..., uPB...: µ PB..., uPC...: µ PC..., uPD...: µ PD...
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H

Ref. No.	Part No.	Description			Remark
*	A-4699-377-A	AC SW BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
⚠C901	1-113-925-11	CERAMIC	0.01uF	20%	250V
		< CONNECTOR >			
CN901	1-690-123-21	LEAD (WITH CONNECTOR) (2 CORE)			
CN902	1-564-321-00	PIN, CONNECTOR 2P			
		< CONNECTOR >			
⚠CNP901	1-251-234-11	INLET, AC (~ AC IN)			
		< SWITCH>			
⚠S901	1-762-876-11	SWITCH, AC POWER (POWER)			
**********					
*	A-4699-391-A	CARRIER BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C611	1-164-159-81	CERAMIC	0.1uF		50V
C612	1-164-159-81	CERAMIC	0.1uF		50V
C613	1-164-159-81	CERAMIC	0.1uF		50V
C614	1-164-159-81	CERAMIC	0.1uF		50V
C615	1-164-159-81	CERAMIC	0.1uF		50V
		< CONNECTOR >			
CN609	1-778-766-11	CONNECTOR, FFC/FPC 20P			
* CN610	1-564-497-11	PIN, CONNECTOR 4P			
* CN611	1-564-496-11	PIN, CONNECTOR 3P			
CN613	1-580-858-21	SOCKET, CONNECTOR (SMT) 5P			
* CN614	1-569-998-11	PIN, CONNECTOR (PC BOARD) 2P			
* CN615	1-580-003-11	PIN, CONNECTOR (PC BOARD) 6P			
* CN616	1-564-497-11	PIN, CONNECTOR 4P			
* CN617	1-564-497-11	PIN, CONNECTOR 4P			

Ref. No.	Part No.	Description			Remark
		< MOTOR>			
M651	X-4947-679-1	MOTOR (CLIP) ASSY			
M652	X-4947-664-1	MOTOR (EV) ASSY (ELEVATOR)			
		< RESISTOR >			
R648	1-249-409-11	CARBON	220	5%	1/4W F
R649	1-249-418-11	CARBON	1.2K	5%	1/4W F
**********					
*	1-664-892-11	COVER BOARD			
		**********			
		< CONNECTOR >			
CN002	1-506-481-11	PIN, CONNECTOR 2P			
		< MOTOR>			
M003	X-4947-712-1	MOTOR ASSY (CHUCK)			
**********					
*	A-4699-389-A	CLIP (IN) BOARD, COMPLETE			
		**********			
		< SWITCH >			
S654	1-762-149-11	SWITCH, PUSH (1 KEY)(CLIP RELEASE DET)			
S655	1-762-149-11	SWITCH, PUSH (1 KEY)(CLIP HOLD UP DET)			
**********					
*	A-4699-390-A	CLIP (OUT) BOARD, COMPLETE			
		**********			
		< SWITCH >			
S651	1-762-149-11	SWITCH, PUSH (1 KEY)(CLIP HOLD DET)			
S652	1-762-149-11	SWITCH, PUSH (1 KEY)(CLIP RETURN DET)			
S653	1-762-855-11	SWITCH, PUSH (1 KEY)(CLIP EMPTY DET)			
**********					

CN **DIP SW** **DISC SENSOR** **FG** **FILTER** **LED** **LDSW**

Ref. No.	Part No.	Description			Remark
*	1-664-724-11	CN BOARD *********			
		< CONNECTOR >			
* CN56	1-564-004-11	PIN, CONNECTOR 5P			
**********					
*	A-4699-373-A	DIP SW BOARD, COMPLETE **********			
		< SWITCH >			
S601	1-771-164-11	SWITCH, DIP (DISC DRIVE A)			
S602	1-771-164-11	SWITCH, DIP (DISC DRIVE B)			
S603	1-554-556-00	SWITCH, DIP (ROBOTICS)			
**********					
*	A-4699-378-A	DISC SENSOR BOARD, COMPLETE **********			
*	4-986-007-01	HOLDER (PH)			
		< CAPACITOR >			
C651	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< CONNECTOR >			
CN650	1-770-636-11	CONNECTOR, FFC/FPC 5P			
		< DIODE >			
D651	8-719-061-32	DIODE GL4800			
		< PHOTO INTERUPTER >			
PH651	8-729-012-65	PHOTO INTERRUPTER TPS808			
**********					
*	A-4699-380-A	FG BOARD, COMPLETE **********			
		< CAPACITOR >			
C652	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< IC >			
IC651	8-749-924-54	IC PHOTO INTERRUPTER GP1A30R			
		< RESISTOR >			
R691	1-216-025-91	METAL GLAZE	100	5%	1/10W
R692	1-216-009-00	METAL CHIP	22	5%	1/10W
**********					

Ref. No.	Part No.	Description			Remark
*	A-4699-384-A	FILTER BOARD, COMPLETE **********			
	1-533-293-11	FUSE HOLDER			
		< CAPACITOR >			
⚠C902	1-113-925-11	CERAMIC	0.01uF	20%	250V
⚠C903	1-113-925-11	CERAMIC	0.01uF	20%	250V
⚠C904	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C905	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C906	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C907	1-113-920-11	CERAMIC	0.0022uF	20%	250V
		< CONNECTOR >			
CN903	1-564-321-00	PIN, CONNECTOR 2P			
CN904	1-568-106-11	PIN, CONNECTOR 4P			
CN912	1-564-321-00	PIN, CONNECTOR 2P			
CN913	1-568-106-11	PIN, CONNECTOR 4P			
		< FUSE >			
⚠F901	1-532-388-51	FUSE, TIME-LAG (T2AL/250V)			
		< FILTER>			
⚠T901	1-416-321-11	COIL, LINE FILTER			
**********					
*	1-664-725-11	LED BOARD *********			
		< CAPACITOR >			
C55	1-163-038-91	CERAMIC CHIP	0.1uF		
C56	1-163-038-91	CERAMIC CHIP	0.1uF		
		< CONNECTOR >			
CN58	1-564-002-11	PIN, CONNECTOR 3P			
**********					
*	A-4699-548-A	LDSW BOARD, COMPLETE **********			
*	1-535-303-00	WIRE, JUMPER			
		< CAPACITOR >			
C51	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C52	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN51	1-695-017-11	CONNECTOR, FFC/FPC 7P			

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Ref. No.	Part No.	Description			Remark
		< JUMPER RESISTOR >			
JC51	1-216-295-91	CONDUCTOR, CHIP (2012)			
JC52	1-216-295-91	CONDUCTOR, CHIP (2012)			
		< TRANSISTOR >			
Q51	8-729-424-08	TRANSISTOR UN2111			
Q52	8-729-424-08	TRANSISTOR UN2111			
		< RESISTOR >			
R51	1-414-594-11	FERRITE BEAD			
R52	1-414-594-11	FERRITE BEAD			
R53	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R54	1-216-073-00	METAL CHIP	10K	5%	1/10W
R55	1-216-073-00	METAL CHIP	10K	5%	1/10W
R56	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R57	1-216-049-91	METAL GLAZE	1K	5%	1/10W
		< SWITCH >			
S51	1-762-149-11	SWITCH, PUSH (1 KEY)(UNCHUCKING DET)			
S52	1-762-149-11	SWITCH, PUSH (1 KEY)(CHUCKING DET)			
**********					
*	A-4699-386-A	M BOX BOARD, COMPLETE			
		**********			
		< CONNECTOR >			
* CN632	1-564-337-71	PIN, CONNECTOR 3P			
* CN634	1-564-337-00	PIN, CONNECTOR 3P			
* CN637	1-564-336-61	PIN, CONNECTOR 2P			
* CN638	1-564-336-00	PIN, CONNECTOR 2P			
* CN639	1-564-336-71	PIN, CONNECTOR 2P			
* CN640	1-506-503-11	PIN, CONNECTOR 9P			
**********					
*	A-4699-394-A	M BOX SW BOARD, COMPLETE			
		**********			
		< SWITCH >			
S631	1-571-300-21	SWITCH, ROTARY (MAIL BOX TRAY IN/OUT DET)			
**********					
*	A-4630-794-A	MA-C22 BOARD, COMPLETE			
		**********			
	1-770-277-11	SOCKET, SHORT 2P			
		< CAPACITOR >			
C101	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C102	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C103	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C104	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C105	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C106	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C107	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C108	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C109	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C110	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C111	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C112	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C113	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C114	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C115	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C116	1-233-856-21	CONDENSER ARRAY	0.1uF		
C117	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C120	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C121	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-126-395-11	ELECT	22uF	20%	16V
C125	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C127	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C130	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C134	1-163-087-00	CERAMIC CHIP	4PF		50V
C135	1-163-091-00	CERAMIC CHIP	8PF		50V
C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C154	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C155	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C157	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C158	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C159	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C160	1-163-143-00	CERAMIC CHIP	0.0012uF	5%	50V
C161	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C162	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C163	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C164	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C165	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C167	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C168	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C169	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C170	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C171	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C172	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C173	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C174	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C175	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C176	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C177	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C178	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C179	1-104-852-11	TANTAL. CHIP	22uF	20%	10V
C180	1-124-779-00	ELECT CHIP	10uF	20%	16V
C181	1-124-779-00	ELECT CHIP	10uF	20%	16V
C182	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V

MA-C22

Ref. No.	Part No.	Description			Remark
C183	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C186	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C187	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C189	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C191	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C192	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C193	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C201	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C202	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C203	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C204	1-164-346-11	CERAMIC CHIP	1uF		16V
C205	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C206	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C207	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C208	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C211	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C212	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C213	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C214	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C216	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C218	1-164-346-11	CERAMIC CHIP	1uF		16V
C221	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C223	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C227	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C228	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C230	1-124-779-00	ELECT CHIP	10uF	20%	16V
C231	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C235	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C236	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C401	1-233-856-21	CONDENSER ARRAY		0.1uF	
C404	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C405	1-126-395-11	ELECT	22uF	20%	16V
C406	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C407	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C408	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C409	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C410	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C411	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C413	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C417	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C418	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C419	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C420	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C421	1-104-559-11	FILM CHIP	0.047uF	5%	16V
C450	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C451	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C461	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C462	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C463	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C501	1-126-204-11	ELECT CHIP	47uF	20%	16V
C502	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C503	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C504	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C505	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CNJ101	1-506-467-11	PIN, CONNECTOR 2P			
CNJ102	1-770-674-11	CONNECTOR, FFC/FPC 16P			
* CNJ103	1-770-415-11	CONNECTOR, FFC/FPC 11P			
* CNJ104	1-766-521-11	PIN, CONNECTOR (PC BOARD) 4P			
CNJ105	1-566-523-11	SOCKET, CONNECTOR 7P			
CNJ106	1-506-481-11	PIN, CONNECTOR 2P			
* CNJ201	1-766-427-11	CONNECTOR, COMBINATION 54P			
* CNJ202	1-766-428-11	PIN, CONNECTOR 13P			
		< DIODE >			
D101	8-719-938-75	DIODE SB05-05CP			
D201	8-719-210-39	DIODE EC10QS-04			
D501	8-719-400-71	DIODE MA3082			
		< THEMISTOR>			
⚠F202	1-533-817-21	THEMISTOR			
		< IC >			
IC101	8-759-449-77	IC TA2106FN(EL)			
IC102	8-759-449-84	IC LA6539M-TE-L			
IC103	8-759-701-39	IC NJM3404AM			
IC104	8-759-242-64	IC TC4W53F			
IC105	8-759-449-75	IC TC9439F(BS,DRY,8)			
IC106	8-759-449-79	IC BA6321FS-E2			
IC107	8-759-449-58	IC LM7131BCM5X			
IC201	8-759-451-98	IC HD6433032SSNG01F			
IC202	8-752-382-66	IC CXD1804AR			
IC203	8-759-342-01	IC MB814260-70PJER			
IC205	8-759-449-83	IC BU6243K			
IC207	8-759-454-20	IC M28F512-90C1TR			
IC401	8-759-384-55	IC LA6527N			
IC402	8-759-395-35	IC LB1916			
IC403	8-759-242-64	IC TC4W53F			
IC501	8-759-052-52	IC L78M05T-FA			
		< COIL >			
L101	1-414-551-11	INDUCTOR, MICRO (CHIP)			
L102	1-414-551-11	INDUCTOR, MICRO (CHIP)			
L103	1-414-551-11	INDUCTOR, MICRO (CHIP)			
L150	1-414-235-11	INDUCTOR, FERRITE BEAD			
L401	1-414-267-11	INDUCTOR 10uH			
L503	1-500-202-11	BEAD, FERRITE			
L504	1-500-202-11	BEAD, FERRITE			
		< MOTOR>			
M001	A-4608-415-B	MOTOR ASSY (SLED)			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
M002	A-4672-402-A	MOTOR ASSY (SPINDLE)			
		< TRANSISTOR >			
Q101	8-729-101-07	TRANSISTOR 2SB798-DL			
Q103	8-729-900-53	TRANSISTOR DTC114EK			
Q104	8-729-422-29	TRANSISTOR 2SD601A-S			
Q105	8-729-422-29	TRANSISTOR 2SD601A-S			
Q106	8-729-216-22	TRANSISTOR 2SA1162-G			
Q107	8-729-216-22	TRANSISTOR 2SA1162-G			
Q111	8-729-230-88	TRANSISTOR 2SC3123-TE85R			
Q112	8-729-230-88	TRANSISTOR 2SC3123-TE85R			
Q113	8-729-230-88	TRANSISTOR 2SC3123-TE85R			
		< RESISTOR >			
R101	1-216-625-11	METAL CHIP	82	0.5%	1/10W
R104	1-218-758-11	METAL CHIP	180K	0.50%	1/10W
R105	1-218-758-11	METAL CHIP	180K	0.50%	1/10W
R106	1-216-610-11	METAL CHIP	20	0.50%	1/10W
R107	1-216-610-11	METAL CHIP	20	0.50%	1/10W
R110	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R112	1-216-643-11	METAL CHIP	470	0.5%	1/10W
R114	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R119	1-216-295-91	CONDUCTOR, CHIP (2012)			
R120	1-216-073-00	METAL CHIP	10K	5%	1/10W
R121	1-216-295-91	CONDUCTOR, CHIP (2012)			
R122	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R123	1-216-295-91	CONDUCTOR, CHIP (2012)			
R124	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W
R126	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R127	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R128	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R129	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R130	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R132	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R138	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R140	1-216-643-11	METAL CHIP	470	0.5%	1/10W
R141	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R142	1-216-295-91	CONDUCTOR, CHIP (2012)			
R143	1-216-643-11	METAL CHIP	470	0.5%	1/10W
R144	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R145	1-216-648-11	METAL CHIP	750	0.5%	1/10W
R151	1-216-081-00	METAL CHIP	22K	5%	1/10W
R152	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R153	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R154	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R155	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R156	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R157	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R160	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R168	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R169	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R170	1-216-061-00	METAL CHIP	3.3K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R171	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R172	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R173	1-216-643-11	METAL CHIP	470	0.5%	1/10W
R174	1-216-643-11	METAL CHIP	470	0.5%	1/10W
R175	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R176	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R179	1-216-033-00	METAL CHIP	220	5%	1/10W
R180	1-216-025-91	METAL GLAZE	100	5%	1/10W
R181	1-216-081-00	METAL CHIP	22K	5%	1/10W
R202	1-216-041-00	METAL CHIP	470	5%	1/10W
R210	1-216-113-00	METAL CHIP	470K	5%	1/10W
R220	1-216-073-00	METAL CHIP	10K	5%	1/10W
R221	1-216-073-00	METAL CHIP	10K	5%	1/10W
R222	1-216-295-91	CONDUCTOR, CHIP (2012)			
R226	1-216-073-00	METAL CHIP	10K	5%	1/10W
R227	1-216-033-00	METAL CHIP	220	5%	1/10W
R228	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R233	1-216-073-00	METAL CHIP	10K	5%	1/10W
R235	1-216-073-00	METAL CHIP	10K	5%	1/10W
R239	1-216-073-00	METAL CHIP	10K	5%	1/10W
R240	1-216-073-00	METAL CHIP	10K	5%	1/10W
R242	1-216-033-00	METAL CHIP	220	5%	1/10W
R244	1-216-073-00	METAL CHIP	10K	5%	1/10W
R245	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R247	1-216-001-00	METAL CHIP	10	5%	1/10W
R248	1-216-001-00	METAL CHIP	10	5%	1/10W
R249	1-216-001-00	METAL CHIP	10	5%	1/10W
R251	1-216-295-91	CONDUCTOR, CHIP (2012)			
R253	1-216-037-00	METAL CHIP	330	5%	1/10W
R254	1-216-077-00	METAL CHIP	15K	5%	1/10W
R255	1-216-041-00	METAL CHIP	470	5%	1/10W
R257	1-216-295-91	CONDUCTOR, CHIP (2012)			
R401	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R402	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R403	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R404	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R410	1-218-758-11	METAL CHIP	180K	0.50%	1/10W
R411	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R412	1-218-768-11	METAL CHIP	470K	0.50%	1/10W
R413	1-218-760-11	METAL CHIP	220K	0.50%	1/10W
R414	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R415	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R417	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R418	1-218-760-11	METAL CHIP	220K	0.50%	1/10W
R419	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R420	1-216-696-11	METAL CHIP	75K	0.5%	1/10W
R421	1-220-745-11	RES, CHIP	0.56	5%	1/2W
R422	1-216-295-91	CONDUCTOR, CHIP (2012)			
R423	1-216-295-91	CONDUCTOR, CHIP (2012)			
R450	1-216-001-00	METAL CHIP	10	5%	1/10W
R451	1-216-001-00	METAL CHIP	10	5%	1/10W
R453	1-216-295-91	CONDUCTOR, CHIP (2012)			

MA-C22 MAIN

Ref. No.	Part No.	Description			Remark
R455	1-216-295-91	CONDUCTOR, CHIP (2012)			
R456	1-216-076-00	METAL CHIP	13K	5%	1/10W
R459	1-216-681-11	METAL CHIP	18K	0.5%	1/10W
R465	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R501	1-218-618-11	METAL CHIP	22	5%	1W
R502	1-218-618-11	METAL CHIP	22	5%	1W
		< COMPOSITION CIRCUIT BLOCK >			
RB102	1-236-420-11	RES, NETWORK 4.7K			
RB103	1-233-578-11	RES, CHIP NETWORK 47K			
RB111	1-233-870-11	RES, NETWORK 10K X 4			
RB112	1-233-871-21	RES, NETWORK 47K X 4			
RB205	1-233-578-11	RES, CHIP NETWORK 47K			
RB206	1-233-578-11	RES, CHIP NETWORK 47K			
RB207	1-233-578-11	RES, CHIP NETWORK 47K			
RB208	1-233-578-11	RES, CHIP NETWORK 47K			
RB401	1-233-574-11	RES, CHIP NETWORK 10			
RB403	1-233-574-11	RES, CHIP NETWORK 10			
RB404	1-233-418-11	RES, CHIP NETWORK 3.3K (3216)			
RB405	1-233-418-11	RES, CHIP NETWORK 3.3K (3216)			
		< VIBRATOR >			
X150	1-767-346-11	VIBRATOR, CERAMIC (50.8032MHz)			
X151	1-767-128-11	VIBRATOR, CERAMIC (33.8688MHz)			
X201	1-767-159-11	VIBRATOR, CERAMIC (40MHz)			
X202	1-579-907-21	VIBRATOR, CERAMIC (20MHz)			
**********					
*	A-4699-367-A	MAIN BOARD, COMPLETE **********			
*	4-942-204-01	PLATE, GROUND			
		< BATTERY >			
BT701	1-528-229-41	BATTERY, LITHIUM (CR-2450)			
		< BATTERY HOLDER >			
* BT701H	1-759-081-11	HOLDER, BATTERY			
		< CAPACITOR >			
C701	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C702	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C703	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C704	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C705	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C706	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C707	1-135-166-21	TANTALUM CHIP	47uF	10%	10V
C708	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C709	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C710	1-165-319-11	CERAMIC CHIP	0.1uF		50V

Ref. No.	Part No.	Description			Remark
C711	1-163-205-00	CERAMIC CHIP	0.001uF	5%	50V
C712	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C713	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C715	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C716	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C717	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C718	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C719	1-126-967-11	ELECT	47uF	20%	16V
C720	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C721	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C722	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C723	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C724	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C725	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C726	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C727	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C728	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C729	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C730	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C731	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C732	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C733	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C734	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C735	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C736	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C737	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C738	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C739	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C740	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C741	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C742	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C743	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C744	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C745	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C746	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C747	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C748	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C749	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C750	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C751	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C752	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C753	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C754	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C755	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C756	1-126-967-11	ELECT	47uF	20%	16V
C757	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C758	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C759	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C760	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C761	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C762	1-104-666-11	ELECT	220uF	20%	25V
C763	1-165-319-11	CERAMIC CHIP	0.1uF		50V

Ref. No.	Part No.	Description			Remark
C764	1-104-665-11	ELECT	100uF	20%	25V
C765	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C766	1-104-665-11	ELECT	100uF	20%	25V
C767	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C768	1-126-967-11	ELECT	47uF	20%	16V
C769	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C770	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C771	1-126-967-11	ELECT	47uF	20%	16V
C772	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C773	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C774	1-126-967-11	ELECT	47uF	20%	16V
C775	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C776	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C777	1-126-967-11	ELECT	47uF	20%	16V
C778	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C779	1-126-967-11	ELECT	47uF	20%	16V
C780	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C781	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C782	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C784	1-126-964-11	ELECT	10uF	20%	50V
C785	1-126-964-11	ELECT	10uF	20%	50V
C786	1-126-964-11	ELECT	10uF	20%	50V
C787	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C788	1-126-967-11	ELECT	47uF	20%	50V
C789	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C790	1-126-967-11	ELECT	47uF	20%	16V
C791	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C792	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C793	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C794	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C795	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C796	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C797	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C798	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C800	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C801	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C802	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C803	1-136-153-00	FILM	0.01uF	5%	50V
C804	1-136-153-00	FILM	0.01uF	5%	50V
C805	1-136-153-00	FILM	0.01uF	5%	50V
C806	1-136-153-00	FILM	0.01uF	5%	50V
C807	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C808	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C809	1-163-251-91	CERAMIC CHIP	100PF	5%	50V
C810	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C811	1-126-967-11	ELECT	47uF	20%	16V
C812	1-126-967-11	ELECT	47uF	20%	16V
C813	1-135-166-21	TANTALUM CHIP	47uF	10%	10V
C814	1-126-967-11	ELECT	47uF	20%	16V
C815	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C816	1-216-295-91	CONDUCTOR, CHIP (2012)			
C817	1-216-295-91	CONDUCTOR, CHIP (2012)			
C818	1-126-967-11	ELECT	47uF	20%	16V
C819	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C821	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
		< CONNECTOR >			
* CN701	1-564-522-11	PLUG, CONNECTOR 7P			
CN702	1-569-566-11	SOCKET, CONNECTOR 20P			
* CN703	1-568-936-11	PIN, CONNECTOR 9P			
* CN704	1-573-262-11	PIN, CONNECTOR 3P			
* CN705	1-506-503-11	PIN, CONNECTOR 9P			
* CN706	1-573-267-21	PIN, CONNECTOR 8P			
* CN707	1-573-268-11	PIN, CONNECTOR 9P			
* CN708	1-569-993-11	PIN, CONNECTOR (PC BOARD) 6P			
* CN709	1-568-954-11	PIN, CONNECTOR 5P			
* CN710	1-568-954-11	PIN, CONNECTOR 5P			
CN711	1-779-513-11	PIN, CONNECTOR 50P			
		< DIODE >			
D703	8-719-016-74	DIODE 1SS352			
D704	8-719-016-74	DIODE 1SS352			
D705	8-719-016-74	DIODE 1SS352			
D706	8-719-016-74	DIODE 1SS352			
D707	8-719-016-74	DIODE 1SS352			
D708	8-719-016-74	DIODE 1SS352			
D709	8-719-016-74	DIODE 1SS352			
D710	8-719-016-74	DIODE 1SS352			
D711	8-719-016-74	DIODE 1SS352			
D713	8-719-051-89	DIODE SML-010VT-T87			
D714	8-719-051-89	DIODE SML-010VT-T87			
D715	8-719-210-39	DIODE EC10QS-04			
D717	8-719-210-39	DIODE EC10QS-04			
D718	8-719-210-39	DIODE EC10QS-04			
		< FUSE >			
⚠F701	1-533-483-11	FUSE (SMD)(1.6A/125V)			
		< IC >			
IC701	8-759-283-49	IC HD6413002F10			
IC702	8-752-381-84	IC CXD1095Q			
IC703	8-759-478-72	IC MX27C1024DC-70-CDL1100-1.00			
IC704	8-752-337-79	IC CXK58257AM-10LL			
IC705	8-759-926-11	IC SN74HC138ANS			
IC706	8-759-269-92	IC SN74HCU04ANS-E20			
IC707	8-759-925-90	IC SN74HC74ANS			
IC708	8-759-298-13	IC FAS204A			
IC709	8-759-252-59	IC MAX202CSE			
IC710	8-759-239-50	IC TA8415P			
IC711	8-759-208-70	IC TD62308AP			
IC712	8-759-501-73	IC BA6418N			
IC713	8-759-059-28	IC LA5536			
IC714	8-759-501-73	IC BA6418N			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

MAIN

Ref. No.	Part No.	Description				Remark
IC715	8-759-059-28	IC LA5536				
IC716	8-759-056-84	IC S-8420AF				
IC717	8-759-927-72	IC TL1591CP				
IC718	8-759-927-72	IC TL1591CP				
IC719	8-759-504-12	IC X24C01S				
		< SOCKET >				
* IC703	1-526-835-11	SOCKET, IC (40P)				
		< COIL >				
L701	1-412-028-22	INDUCTOR	4.7uH			
L702	1-412-028-22	INDUCTOR	4.7uH			
L703	1-412-028-22	INDUCTOR	4.7uH			
L704	1-412-028-22	INDUCTOR	4.7uH			
L705	1-543-775-21	FILTER, EMI				
L706	1-412-028-22	INDUCTOR	4.7uH			
L707	1-412-028-22	INDUCTOR	4.7uH			
L708	1-412-028-22	INDUCTOR	4.7uH			
L709	1-412-028-22	INDUCTOR	4.7uH			
		< IC LINK >				
⚠PS701	1-532-637-00	LINK, IC (ICP-N25/1A)				
		< TRANSISTOR >				
Q704	8-729-422-73	TRANSISTOR UN4212				
Q705	8-729-422-73	TRANSISTOR UN4212				
Q706	8-729-422-73	TRANSISTOR UN4212				
Q707	8-729-422-73	TRANSISTOR UN4212				
Q708	8-729-422-73	TRANSISTOR UN4212				
Q709	8-729-422-73	TRANSISTOR UN4212				
Q712	8-729-822-84	TRANSISTOR 2SB1202FAST				
Q713	8-729-402-45	TRANSISTOR UN5212				
Q714	8-729-015-11	TRANSISTOR 2SD1802FAST-TL				
Q715	8-729-924-04	TRANSISTOR DTA143TU				
Q716	8-729-810-13	TRANSISTOR 2SA1677				
Q717	8-729-904-36	TRANSISTOR DTC114YS				
		< RESISTOR >				
R739	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R740	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R741	1-216-033-00	METAL CHIP	220	5%	1/10W	
R742	1-216-033-00	METAL CHIP	220	5%	1/10W	
R743	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R744	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R745	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R757	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R758	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R759	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R760	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R761	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R762	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R764	1-216-081-00	METAL CHIP	22K	5%	1/10W	

Ref. No.	Part No.	Description			Remark
R774	1-216-077-00	METAL CHIP	15K	5%	1/10W
R777	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R778	1-216-081-00	METAL CHIP	22K	5%	1/10W
R779	1-216-081-00	METAL CHIP	22K	5%	1/10W
R780	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R781	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R782	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R783	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R784	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R785	1-216-073-00	METAL CHIP	10K	5%	1/10W
R786	1-216-073-00	METAL CHIP	10K	5%	1/10W
R787	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R788	1-216-073-00	METAL CHIP	10K	5%	1/10W
R789	1-216-073-00	METAL CHIP	10K	5%	1/10W
R790	1-218-626-11	METAL CHIP	100	5%	1W
R791	1-216-013-00	METAL CHIP	33	5%	1/10W
R792	1-218-626-11	METAL CHIP	100	5%	1W
R793	1-216-609-11	METAL CHIP	18	0.5%	1/10W
R794	1-216-081-00	METAL CHIP	22K	5%	1/10W
R795	1-216-081-00	METAL CHIP	22K	5%	1/10W
R796	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R797	1-216-073-00	METAL CHIP	10K	5%	1/10W
R799	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R800	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R801	1-216-073-00	METAL CHIP	10K	5%	1/10W
R802	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R803	1-216-077-00	METAL CHIP	15K	5%	1/10W
R804	1-216-073-00	METAL CHIP	10K	5%	1/10W
R805	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R806	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R808	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R809	1-216-081-00	METAL CHIP	22K	5%	1/10W
R810	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R811	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R812	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R813	1-216-073-00	METAL CHIP	10K	5%	1/10W
R814	1-216-073-00	METAL CHIP	10K	5%	1/10W
R815	1-216-033-00	METAL CHIP	220	5%	1/10W
R816	1-216-073-00	METAL CHIP	10K	5%	1/10W
R817	1-216-073-00	METAL CHIP	10K	5%	1/10W
R818	1-216-081-00	METAL CHIP	22K	5%	1/10W
R819	1-216-081-00	METAL CHIP	22K	5%	1/10W
R822	1-216-025-91	METAL GLAZE	100	5%	1/10W
R823	1-216-025-91	METAL GLAZE	100	5%	1/10W
R824	1-216-041-00	METAL CHIP	470	5%	1/10W
R825	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R826	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R827	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R828	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R829	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R830	1-216-097-91	METAL GLAZE	100K	5%	1/10W

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Ref. No.	Part No.	Description			Remark
R831	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R832	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R833	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R834	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R835	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R836	1-216-025-91	METAL GLAZE	100	5%	1/10W
R837	1-216-033-00	METAL CHIP	220	5%	1/10W
R838	1-216-033-00	METAL CHIP	220	5%	1/10W
R839	1-216-033-00	METAL CHIP	220	5%	1/10W
		< COMPOSITION CIRCUIT BLOCK >			
RB801	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB802	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB803	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB804	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB805	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB806	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB807	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB808	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB809	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB810	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB811	1-233-411-11	RES, CHIP NETWORK 220 (3216)			
RB812	1-233-411-11	RES, CHIP NETWORK 220 (3216)			
RB813	1-236-908-11	RES, CHIP NETWORK 10K (3216)			
RB814	1-236-908-11	RES, CHIP NETWORK 10K (3216)			
RB815	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
RB816	1-233-416-11	RES, CHIP NETWORK 22K (3216)			
		< RELAY >			
RY701	1-515-716-11	RELAY (TQ2-5V)			
		< VIBRATOR >			
X701	1-577-234-11	OSCILLATOR, CRYSTAL (19.6608MHz)			
**********					
*	A-4699-395-A	MBDS BOARD, COMPLETE **********			
	4-964-461-02	HOLDER (SENSOR)			
		< TRANSISTOR >			
Q631	8-729-926-31	PHOTO TRANSISTOR PT483F1S			
**********					
*	A-4699-396-A	MBLD BOARD, COMPLETE **********			
	4-964-461-02	HOLDER (SENSOR)			
		< DIODE >			
D632	8-719-029-95	DIODE TLN117			
**********					

Ref. No.	Part No.	Description			Remark
*	A-4699-397-A	MBMO BOARD, COMPLETE **********			
		< CAPACITOR >			
C631	1-164-159-81	CERAMIC	0.1uF		50V
		< MOTOR>			
M631	X-4947-713-1	MOTOR (T) ASSY (MAIL BOX TRAY)			
**********					
*	A-4699-393-A	MD LED BOARD, COMPLETE **********			
		< CAPACITOR >			
C501	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
		< CONNECTOR >			
* CN54	1-568-942-11	PIN, CONNECTOR 4P			
* CN57	1-580-002-11	PIN, CONNECTOR (PC BOARD) 5P			
CN60	1-564-517-11	CONNECTOR 2P			
		< COIL >			
L801	1-444-594-11	INDUCTOR, FERRITE BEAD			
L802	1-444-594-11	INDUCTOR, FERRITE BEAD			
L803	1-444-594-11	INDUCTOR, FERRITE BEAD			
		< DIODE >			
D51	8-719-064-83	DIODE SML78420CTH8F (AUDIO OUT/BUSY)			
		< JACK >			
J51	1-573-191-11	JACK (LINE OUT A/B)			
		< RESISTOR >			
R851	1-216-033-00	METAL CHIP	220	5%	1/10W
R852	1-216-033-00	METAL CHIP	220	5%	1/10W
**********					
*	A-4699-388-A	P LED BOARD, COMPLETE **********			
		< DIODE >			
D631	8-719-061-31	DIODE SML72420CTH8F (POWER)			
		< RESISTOR >			
R681	1-249-409-11	CARBON	220	5%	1/4W F
R682	1-249-409-11	CARBON	220	5%	1/4W F
**********					

PANEL PS

Ref. No.	Part No.	Description			Remark
*	A-4699-371-A	PANEL BOARD, COMPLETE **********			
		< CAPACITOR >			
C601	1-124-589-11	ELECT	47uF	20%	16V
C602	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C604	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< LIQUID CRYSTAL DISPLAY>			
ND601	1-801-530-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< CONNECTOR >			
CN604	1-569-225-11	SOCKET, CONNECTOR 14P			
* CN605	1-573-279-11	PIN, CONNECTOR 9P			
* CN606	1-573-278-11	PIN, CONNECTOR 8P			
		< RESISTOR >			
R601	1-216-093-00	METAL CHIP	68K	5%	1/10W
R602	1-216-093-00	METAL CHIP	68K	5%	1/10W
R603	1-216-093-00	METAL CHIP	68K	5%	1/10W
R604	1-216-093-00	METAL CHIP	68K	5%	1/10W
R605	1-216-093-00	METAL CHIP	68K	5%	1/10W
R606	1-216-085-00	METAL CHIP	33K	5%	1/10W
R607	1-216-085-00	METAL CHIP	33K	5%	1/10W
R608	1-216-085-00	METAL CHIP	33K	5%	1/10W
R609	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R610	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R611	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R612	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R613	1-216-073-00	METAL CHIP	10K	5%	1/10W
R614	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R615	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R616	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R617	1-216-045-00	METAL CHIP	680	5%	1/10W
R618	1-216-041-00	METAL CHIP	470	5%	1/10W
R619	1-216-033-00	METAL CHIP	220	5%	1/10W
R620	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R621	1-216-081-00	METAL CHIP	22K	5%	1/10W
R622	1-216-081-00	METAL CHIP	22K	5%	1/10W
R623	1-216-081-00	METAL CHIP	22K	5%	1/10W
R624	1-216-081-00	METAL CHIP	22K	5%	1/10W
R625	1-216-081-00	METAL CHIP	22K	5%	1/10W
R626	1-216-081-00	METAL CHIP	22K	5%	1/10W
R627	1-216-081-00	METAL CHIP	22K	5%	1/10W
R628	1-216-081-00	METAL CHIP	22K	5%	1/10W
R629	1-216-081-00	METAL CHIP	22K	5%	1/10W
R630	1-216-081-00	METAL CHIP	22K	5%	1/10W
R631	1-216-081-00	METAL CHIP	22K	5%	1/10W
		< VARIABLE RESISTOR >			
RV601	1-230-522-11	RES, ADJ, METAL 4.7K			

Ref. No.	Part No.	Description			Remark
		< SWITCH >			
S604	1-570-438-11	SWITCH, DIGITAL(SMALL TYPE)(MODE SELECT)			
S605	1-570-313-11	SWITCH, KEYBOARD (UP)			
S606	1-570-313-11	SWITCH, KEYBOARD (DOWN)			
S607	1-570-313-11	SWITCH, KEYBOARD (LOAD)			
S608	1-570-313-11	SWITCH, KEYBOARD (UNLOAD)			
S609	1-570-313-11	SWITCH, KEYBOARD (SET)			
S610	1-570-313-11	SWITCH, KEYBOARD (DISPLAY)			
S611	1-570-313-11	SWITCH, KEYBOARD (CANCEL)			
S612	1-570-313-11	SWITCH, KEYBOARD			
**********					
*	A-4699-382-A	PS BOARD, COMPLETE **********			
	1-533-293-11	FUSE HOLDER			
	4-902-345-01	HEAT SINK			
*	4-870-539-00	PLATE, GROUND			
	7-685-871-01	SCREW +BVTT 3X6 (S)			
		< CAPACITOR >			
C621	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C908	1-125-742-11	ELECT	12000uF	20%	35V
C909	1-126-955-11	ELECT	4700uF	20%	35V
C910	1-126-953-11	ELECT	2200uF	20%	35V
C911	1-128-551-11	ELECT	22uF	20%	25V
C912	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C913	1-104-665-11	ELECT	100uF	20%	25V
C914	1-104-665-11	ELECT	100uF	20%	25V
C915	1-128-551-11	ELECT	22uF	20%	25V
C916	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C917	1-104-665-11	ELECT	100uF	20%	25V
C918	1-104-665-11	ELECT	100uF	20%	25V
C919	1-128-551-11	ELECT	22uF	20%	25V
C920	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V
C921	1-104-665-11	ELECT	100uF	20%	25V
C922	1-104-665-11	ELECT	100uF	20%	25V
C923	1-128-551-11	ELECT	22uF	20%	25V
C924	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C925	1-104-665-11	ELECT	100uF	20%	25V
C926	1-104-665-11	ELECT	100uF	20%	25V
C927	1-128-551-11	ELECT	22uF	20%	25V
C928	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V
C929	1-104-665-11	ELECT	100uF	20%	25V
C930	1-104-665-11	ELECT	100uF	20%	25V
C935	1-104-664-11	ELECT	47uF	20%	25V
		< CONNECTOR >			
* CN905	1-564-242-00	PIN, CONNECTOR 5P			
CN906	1-506-987-11	PIN, CONNECTOR (PC BOARD) 5P			
CN907	1-506-987-11	PIN, CONNECTOR (PC BOARD) 5P			
* CN908	1-568-935-11	PIN, CONNECTOR 8P			
* CN910	1-566-418-11	CONNECTOR (PIN HEADER) 4P			

PS **RS** **RST**

Ref. No.	Part No.	Description	Remark
* CN911	1-566-418-11	CONNECTOR (PIN HEADER) 4P	
		< DIODE >	
D901	8-719-025-03	DIODE RBA-402-SL	
D902	8-719-025-03	DIODE RBA-402-SL	
D903	8-719-210-39	DIODE EC10QS-04	
D904	8-719-210-39	DIODE EC10QS-04	
D905	8-719-210-39	DIODE EC10QS-04	
D906	8-719-210-39	DIODE EC10QS-04	
D907	8-719-210-39	DIODE EC10QS-04	
		< FUSE >	
⚠F902	1-532-465-51	FUSE, TIME-LAG (T3.15AL/250V)	
⚠F903	1-532-388-51	FUSE, TIME-LAG (T2AL/250V)	
⚠F904	1-532-388-51	FUSE, TIME-LAG (T2AL/250V)	
		< IC >	
IC602	8-759-009-04	IC MC14050BF	
IC901	8-759-442-83	IC MC34166D2TR4	
IC902	8-759-442-83	IC MC34166D2TR4	
IC903	8-759-442-83	IC MC34166D2TR4	
IC904	8-759-442-83	IC MC34166D2TR4	
IC905	8-759-442-83	IC MC34166D2TR4	
IC907	8-759-245-86	IC TA7912S	
		< COIL >	
L901	1-415-951-11	COIL, CHOKE 220uH	
L902	1-415-951-11	COIL, CHOKE 220uH	
L903	1-415-951-11	COIL, CHOKE 220uH	
L904	1-415-951-11	COIL, CHOKE 220uH	
L905	1-415-951-11	COIL, CHOKE 220uH	
		< IC LINK >	
⚠PS901	1-532-675-21	LINK, IC (ICP-N38/1.5A)	
⚠PS902	1-532-675-21	LINK, IC (ICP-N38/1.5A)	
⚠PS903	1-532-686-21	LINK, IC (ICP-N75/2.7A)	
⚠PS904	1-532-675-21	LINK, IC (ICP-N38/1.5A)	
⚠PS905	1-532-675-21	LINK, IC (ICP-N38/1.5A)	
⚠PS906	1-532-685-00	LINK, IC (ICP-N20/0.8A)	
		< RESISTOR >	
R650	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R651	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R652	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R653	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R654	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R655	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R656	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R657	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R658	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R659	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R660	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R661	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R662	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R663	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R664	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R665	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R666	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R667	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R901	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R902	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R903	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R904	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R905	1-216-045-00	METAL CHIP 680 5% 1/10W	
R906	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R907	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R908	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R909	1-216-045-00	METAL CHIP 680 5% 1/10W	
R910	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R911	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R912	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R914	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R915	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R916	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R917	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R918	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R919	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R920	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
**********			
*	A-4699-385-A	RS BOARD, COMPLETE	
		**********	
		< CAPACITOR >	
C660	1-216-295-91	CONDUCTOR, CHIP (2012)	
		< CONNECTOR >	
CNP601	1-764-116-51	PLUG, (D) SUB CONNECTOR 9P (RS-232C)	
**********			
*	A-4699-375-A	RST BOARD, COMPLETE	
		**********	
		< CAPACITOR >	
C653	1-165-319-11	CERAMIC CHIP 0.1uF 50V	
		< PHOTO INTERUPTER >	
PH652	8-719-945-83	PHOTO INTERRUPTER GP-1A51HR	
**********			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

SERVICE VOLSEL

Ref. No.	Part No.	Description			Remark
*	A-4699-369-A	SERVICE BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C606	1-124-589-11	ELECT	47uF	20%	16V
C607	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< RESISTOR >			
R632	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R633	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R634	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R635	1-216-045-00	METAL CHIP	680	5%	1/10W
R636	1-216-041-00	METAL CHIP	470	5%	1/10W
R637	1-216-033-00	METAL CHIP	220	5%	1/10W
R638	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R641	1-216-045-00	METAL CHIP	680	5%	1/10W
R642	1-216-041-00	METAL CHIP	470	5%	1/10W
R643	1-216-033-00	METAL CHIP	220	5%	1/10W
R644	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R645	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R646	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
		< SWITCH >			
S613	1-762-875-21	SWITCH, KEYBOARD (1000)			
S614	1-762-875-21	SWITCH, KEYBOARD (100)			
S615	1-762-875-21	SWITCH, KEYBOARD (10)			
S616	1-762-875-21	SWITCH, KEYBOARD (1)			
**********					
*	A-4699-779-A	VOLSEL BOARD, COMPLETE			
		**********			
		< CONNECTOR >			
CN914	1-690-123-51	REED (WITH CONNECTOR) (2 CORE)			
CN915	1-751-670-51	LEAD (WITH CONNECTOR) (4 CORE)			
		< SWITCH >			
⚠S902	1-554-752-11	SELECTOR, POWER VOLTAGE (VOLTAGE SELECTOR)			
**********					
		MISCELLANEOUS			
		**********			
6	1-777-656-11	WIRE (FLAT TYPE) (20 CORE)			
15	1-782-606-11	LEAD (WITH CONNECTOR)			
151	1-777-657-11	CORD (WITH CONNECTOR)			
162	1-782-471-11	LEAD (WITH CONNECTOR) (2 CORE)			
261	1-777-655-11	WIRE (FLAT TYPE) (5 CORE)			
460	1-777-695-11	WIRE (FLAT TYPE) (7 CORE)			
501	1-777-692-11	WIRE (FLAT TYPE) (11 CORE)			
505	1-782-368-11	WIRE (FLAT TYPE) (16 CORE)			

Ref. No.	Part No.	Description	Remark
⚠517	1-758-007-11	OPTICAL PICK-UP (SPU-3210)	
BT701	1-528-229-41	BATTERY, LITHIUM (CR-2450)	
M001	A-4608-415-B	MOTOR ASSY (SLED)	
M002	A-4672-402-A	MOTOR ASSY (SPINDLE)	
M003	X-4947-712-1	MOTOR ASSY (CHUCKING)	
M631	X-4947-713-1	MOTOR ASSY (MAIL BOX TRAY)	
M651	X-4947-679-1	MOTOR (CLIP) ASSY	
M652	X-4947-664-1	MOTOR (EV) ASSY (ELEVATOR)	
ND601	1-801-530-11	DISPLAY PANEL, LIQUID CRYSTAL	
⚠S901	1-762-876-11	SWITCH, AC POWER (POWER)	
⚠T902	1-429-912-11	TRANSFORMER, POWER	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-251-068-11	TERMINATER, ACTIVE	
⚠	1-551-812-11	CORD, POWER (Parallel Polarized)	
	3-860-458-01	MANUAL, INSTRUCTION	
	4-986-648-01	LOCK (DISC)	
*	4-987-967-01	CUSHION	
*	4-987-968-01	INDIVIDUAL CARTON	
	4-989-060-01	LID (LOCK)	
	X-4947-835-1	SCREW ASSY, TRANSPORT	
**********			
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-871-01	SCREW +BVTT 3X6 (S)	
#2	7-682-145-01	SCREW +P 3X4	
#3	7-627-554-38	SCREW,PRECISION +P 2X1.8 TYPE1	
#4	7-682-558-09	SCREW +B 4X4	
#5	7-685-752-09	SCREW +PTT 3X8 (S)	
#6	7-685-862-09	SCREW +BVTT 2.6X6 (S)	
#7	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
#8	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S	
#9	7-621-259-25	SCREW +P 2.6X4	
#10	7-685-104-19	SCREW (2X6), + PTPWH	
#11	7-624-104-04	STOP RING 2.0, TYPE -E	
#12	7-624-102-04	STOP RING 1.5, TYPE -E	
#13	7-624-101-04	STOP RING 1.2 (E TYPE)	
#14	7-627-552-08	SCREW,PRECISION +P 1.7X2.5	
#15	7-685-535-21	SCREW +BTP 2.6X10 TYPE2 SLIT	
#16	7-627-553-48	SCREW,PRECISION +P 2X4	
#17	7-682-546-04	SCREW +B 3X5	
#18	7-685-103-19	SCREW +P 2X5 TYPE2 NON-SLIT	
#19	7-627-852-28	+P 1.7X3	
#20	7-685-102-19	SCREW +P 2X4 NON-SLIT TYPE 2	
#21	7-682-961-01	SCREW +PSW 4X8	
#22	7-624-106-04	STOP RING 3.0, TYPE -E	
#23	7-685-659-71	SCREW +BVTP 4X8 TYPE2 IT-3	

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Ref. No.	Part No.	Description	Remark
#24	7-627-552-58	SCREW,PRECISION +P 1.7X5	
#25	7-685-872-09	SCREW +BVTT 3X8	
#26	7-682-946-09	SCREW +PSW 3X5	
#27	7-685-133-14	+BTP 2.6X6, TYPE2 NON-SLIT	
#28	7-685-646-79	+BVTP 3X8	

9-920-921-81

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Home A&V Products Company

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